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A CLASS TEST WITH DEAF CHILDREN

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The collection of norms for various ages for certain class tests by Pyle in his "Examination of School Children" is proving valuable for comparative purposes with other groups of children. The writers have given the Digit Symbol Test as a class test to 325 pupils in a school for the deaf,[1] and they have used Pyle's norms as a basis for comparison. This test is primarily a performance test in as much as it does not depend upon language, and therefore we feel that the results are directly comparable with those of hearing children. The question of language, which is such a stumbling-block to the deaf, does not here enter into account.

Pyle's procedure in giving this test is to read out the following directions to the class: "In the circles at the top of the sheet before you are written the nine digits and nine symbols which are to be written in the blank squares below for the digits to which they correspond. Work as fast as you can and try to fill as many of the squares as possible without making mistakes."

We felt that if these directions were written upon the board many of the deaf children would not comprehend what was wanted because of their difficulty in comprehending language, and so we adopted another method. This consisted of drawing

[1] The writers wish here to acknowledge the kindness and courtesy extended to them by Mr. J. W. Jones, Superintendent of the Ohio State School for the Deaf. The substance of this paper was presented to the Committee on Efficiency of the Conference of Superintendents and Principals of American Schools for the Deaf at the meeting held in Columbus, April 13, 1915.

on the blackboard the nine circles with the digits and symbols as they appear on the test sheet. Then samples of two rows of digits were written below the circles. We went through the process of filling in the first blank. Then a child was called to the board and shown how to do it. By this time many of the class understood what was wanted. We next picked out any who seemed not to understand this procedure. In some of the lower grades as many as half the class had their turn at the board until they understood the directions. Then the class was asked if everyone understood. If so, the sample was erased and the test sheets passed around. The examiner held up the sheet and pointed out the circles, the digits, and the blanks, so that the pupils knew what they were to do. The pupils were then required to hold their pencils in the air and at a signal they all started to work. Often some were urged to continue working when their attention seemed to wander. Eight minutes were allowed in grades below the first intermediate, and five minutes for the higher classes. We feel that the conditions governing the test were fair to the pupils. The advantage was certainly on the side of the deaf child as compared with the way in which the test has been given to the hearing child.

We gave the test to all the classes in the school, with the exception of one second primary class and all classes below that. We felt that it would be useless to attempt the test with these lower classes and the results have confirmed our opinion.

The tests of each class were recorded as a class and our records show (1) the name of each member of the class, (2) the age, (3) the score, (4) the age of the hearing child to which this score corresponds (Pyle's norms were used here), (5) the number of years retarded or accelerated (this was obtained by subtracting (3) from (4) or vice versa) and (6) the index, *i. e.*, the ratio of this score to fifty, Pyle's norm for the age in question being put equal to fifty. Fifty would then mean that the two were the same. For each class the median score was selected as the score of the class. The median index stood also as the class index, while the median acceleration or retardation indicated the class standing in terms of years retarded or accelerated.

Manual classes were separated from oral classes and Table I shows the class standing for the oral and manual methods of instruction respectively.

TABLE I

Oral Classes				Manual Classes			
Class	Years Retarded	Median Score	Pyle's Index	Class	Years Retarded	Median Score	Pyle's Index
2d Prim.	3.0+	0.0	0.0	2d Prim.	5.0	7.7	17.0
3d Prim.	3.0	11.5	30.0	3d Prim.	9.0	4.1	7.5
4th Prim.	2.0	15.2	37.0	4th Prim.	3.0	15.2	36.0
5th Prim.	2.5	20.0	38.5	5th Prim.	4.5	16.1	33.0
1st Inter.	2.5	22.2	45.0	1st Inter.	5.5	18.0	34.5
2d Inter.	2.5	21.0	42.0	2d Inter.	4.0	20.6	40.0
3d Inter.	2.0	23.8	43.0				
4th Inter.	3.0	23.0	42.5	4th Inter.	2.0	23.4	46.5
5th Inter.	0.0	27.0	47.5	5th Inter.	5.0	24.4	42.0
Junior High	0	29.6	51.5				
Senior High	0	31.4	51.0				

A glance at this table shows us how each higher grade as a rule increases in learning ability over the lower grades. The index is also interesting as it shows that the more advanced the class the closer it approaches the normal, *i. e.*, fifty. The two high school classes are slightly above normal. This means, we take it, that in the higher classes the best pupils tend to be found, the poorer ones dropping by the wayside, remaining in the lower grades. We can compare the performance of oral and manual classes by the median score in each case. It will be seen that at all grades, with the exception of the second primary, the median score for the oral classes is higher than that of the manual classes. Among the oral classes it is seen that the second and fourth intermediate grades show a decrease in ability from what would be expected. It may be that in these two grades there are a relatively greater number of retarded pupils which would tend to produce the recorded results. If this same tendency were found when other class tests are given, this conclusion might be justified. The oral classes again show a higher index in most cases, *i. e.*, they are nearer what they ought to be than are the manual classes. In no case, however, does any class reach fifty.

In Table II we have separated the manual pupils from the oral pupils and then recorded the results for each chronological age. Reading horizontally across the table we find the various

TABLE II

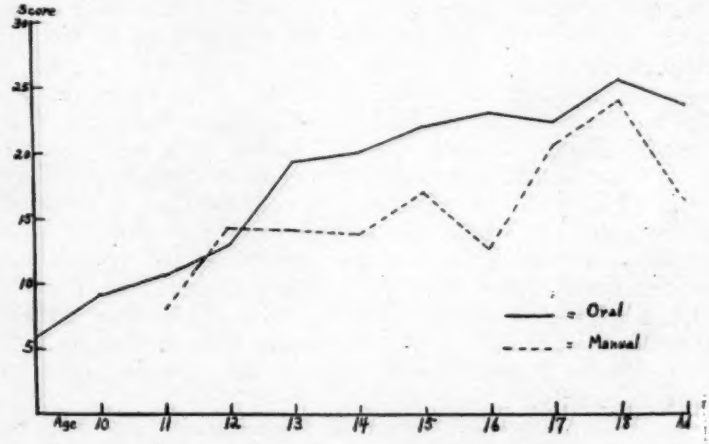
Oral Pupils

Age	9	10	11	12	13	14	15	16	17	18	over 18	Total
Number	6	24	21	20	24	12	17	27	12	10	8	181
25% Quartile	12.9	13.6	12.5	15.0	21.6	20.8	24.6	26.2	27.6	29.8	28.8	
Median	6.0	9.2	10.8	13.0	19.4	20.0	22.0	23.0	22.4	25.6	23.6	
75% Quartile	0	0	0	8.3	15.0	12.8	16.6	21.0	18.2	17.2	17.0	

Manual Pupils

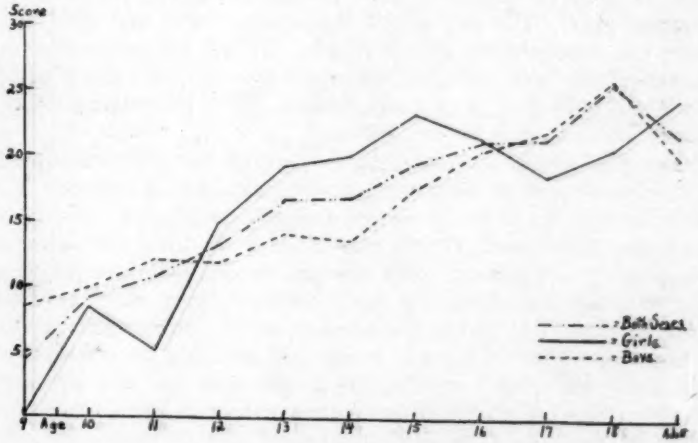
Age	9	10	11	12	13	14	15	16	17	18	over 18	Total
Number	..	..	14	13	11	11	13	24	29	12	17	144
25% Quartile	..	..	15.3	16.5	15.2	21.9	25.0	22.0	25.0	26.0	20.8	
Median	..	..	8.1	14.3	14.1	13.8	17.0	12.8	20.6	24.0	16.4	
75% Quartile	..	..	0	11.9	7.7	4.1	13.8	8.9	12.3	18.2	8.5	

chronological ages. In the second horizontal column is given the number tested; in the third the score reached by twenty-five per cent. of the cases; in the fourth the median; and in the fifth that reached by seventy-five per cent. of the cases. Similarly the results for the manual pupils are recorded below. Graph I represents the median ability of the manual and oral pupils.



GRAPH I.—Comparison of the scores of deaf children, taught by the oral and manual methods respectively, grouped according to age.

This curve shows that there is a constant increase in ability with the oral pupils from age to age with the exception of the seventeen year olds, who make a slightly poorer showing than the sixteen year olds, and again those over eighteen years do worse than the eighteen year olds. The curve is, in fact, fairly regular. This is not the case with the manual pupils. Their curve is irregular, no gain being registered from age twelve to age fourteen. There is a jump at fifteen and then a decided falling off in ability at sixteen. Those over eighteen are decidedly poorer than the eighteen year olds. This curve indicates that the manual pupils are not uniform in their ability from age to age, due probably to an irregular distribution, among the total number of manual pupils, of decidedly retarded pupils. This is borne out by observing that the oral pupils, with the exception of age twelve, are throughout much superior to the manual pupils, indicating that for oral work the brighter pupils are selected. We do not mean to say that every manual pupil is duller than the oral pupil, but the results seem to indicate that ability to profit by the oral method correlates rather highly with general mental ability.

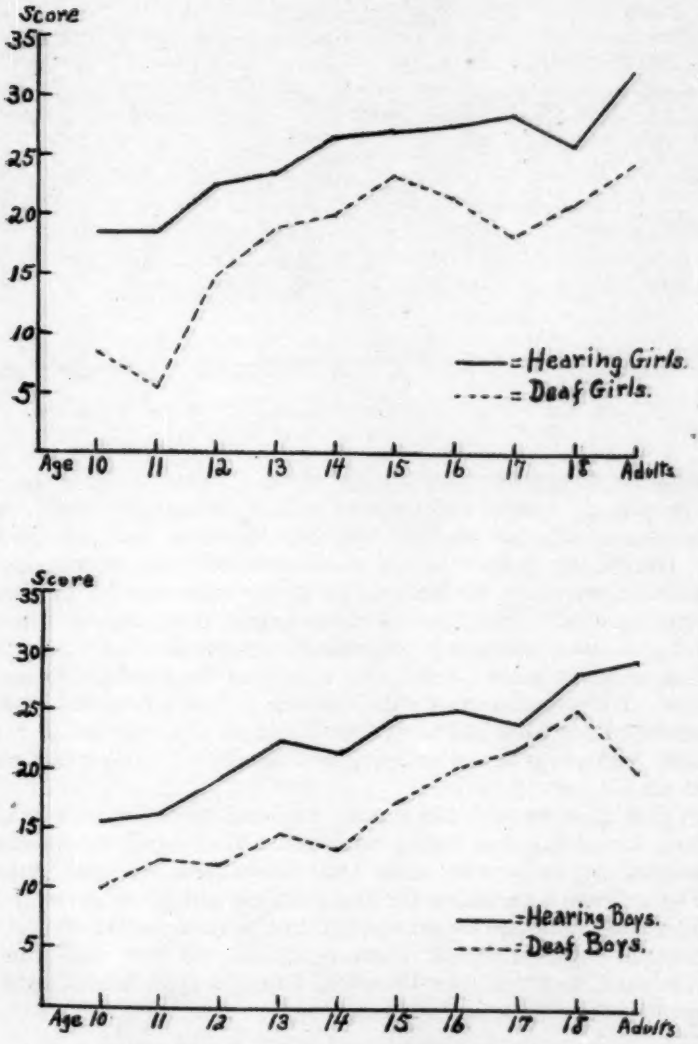


GRAPH II.—The median score for each chronological age.

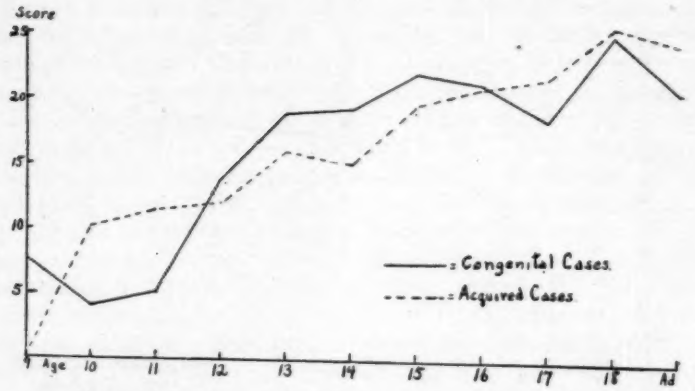
Graph II shows the curve of the medians for all the deaf children taken together, and also the curves for the boys and girls taken separately. The curve for all the pupils is now fairly regular. The inequalities of the curve for manual pupils have more or less disappeared. The sharp decline at the end for those over eighteen is, of course, still prominent. This is, no doubt, due to the fact that those of average ability go through school and finish at or before eighteen, and only those who are dull remain two or three years longer. The other two curves give us the comparison between deaf boys and deaf girls. Up to age twelve the boys are superior, between twelve and seventeen the girls are superior, at ages seventeen and eighteen the boys are again superior, while deaf girls over eighteen are superior to the boys over eighteen. For normal hearing children there is a significant and more or less constant sex difference, the girls throughout all ages being superior. We may say then, that sex differences are not so evident among the deaf, and this may be due to the fact that they do not represent a normal sampling of the two sexes, other factors such as heredity and disease entering in to overcome the sex differences at various parts of the curve.

Graph III shows the median scores for each chronological age for deaf as compared with hearing boys, and for deaf and hearing girls. The curves for the hearing boys and girls have been constructed from Pyle's figures. It will be seen that at no age does the curve for the deaf reach the curve for the hearing. At some ages it is very much below. The irregularity of the curve for deaf girls is very marked.

The deaf can be divided into two groups from the standpoint of the cause of their deafness, i. e., congenital and acquired. The reliability of the ordinary causes assigned by parents is not very high and the school records give little more than the cause as assigned by the parent. We feel that many cases put down as due to sickness or disease in early childhood may well have been congenital, and probably the number called congenital is underestimated. There were 143 congenital and 204 acquired cases, and these were fairly evenly distributed over the ages from ten to seventeen. Graph IV shows the median ability for the two types of deafness at each chronological age. The curves keep so close together and cross each other so often as to allow of no definite conclusions. We cannot say that the congenital are



GRAPH III.—Comparison of hearing and deaf children.



GRAPH IV.—Comparison of congenital and acquired cases of deafness.

superior to the acquired or vice versa. There seems to be on this test no radical difference in ability between the child who is congenitally deaf and the child who becomes deaf after birth.

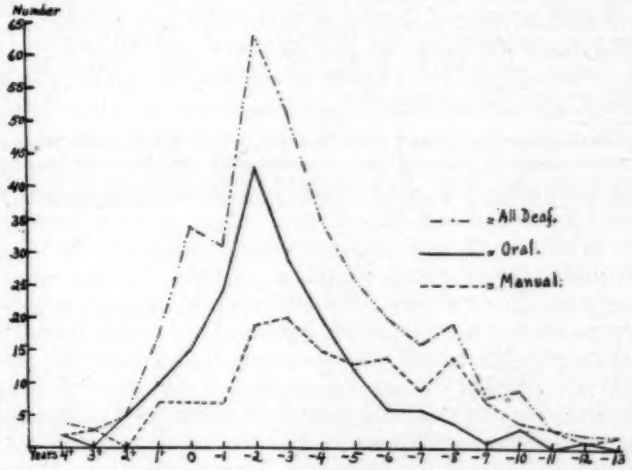
How many years retarded or accelerated is the average deaf child in regard to his learning ability as measured by this substitution test? Our method of answering this question was as follows. We had every individual's record as to his retardation or advancement, using Pyle's norm as the standard for each age. We then calculated the number of years retarded or accelerated for each child. Table III gives the number of children who are retarded or accelerated one, two, three years and so on.

This is shown for the manual and oral pupils separately and then for all the deaf pupils combined. Here again we find the manual pupils showing more retardation than the oral pupils. The average retardation for the different groups is interesting. The oral pupils are on an average two years retarded while the manual pupils are four years retarded. All the deaf pupils combined, to which have been added twenty High School pupils, show a retardation of three years.[2]

[2] This same amount of retardation was arrived at from an entirely different source by the authors in their article, *The Binet Scale and the Deaf Child*, Journal of Educational Psychology, Vol. VI, 4. April, 1915.

TABLE III

Years accelerated or retarded	Manual Pupils			Oral Pupils			All Deaf Pupils		
	Numbe	Percentage of Total	Percentage of Groups	Number	Percentage of Total	Percentage of Groups	Number	Percentage of Total	Percentage of Groups
+4	2	1	3.0	2	1	3.7	4	1	3.4
+3	3	2		0	0		3	1	
+2	0	0		5	2.7		5	1.4	
+1	7	5		10	5.5		17	5	
0	7	5	15.0	15	8.3	26.8	34	9.7	23.7
—1	7	5		24	13.0		31	9	
—2	19	13	26.5	43	23	39.0	63	18	32.6
—3	20	13.5		29	16		51	14.6	
—4	15	10		20	11		35	10	
—5	13	9		12	7		26	7.4	
—6	14	9.5		6	3.3		20	6	
—7	9	6		6	3.3		16	4.6	
—8	14	9.5	55.5	4	2.2	29.6	19	5.4	40.3
—9	7	5		1	0.6		8	2.3	
—10	4	3		3	1.6		9	2.6	
—11	3	2		0	0		3	1	
—12	1	0.5		1	0.6		2	0.5	
—13	2	1		0	0		2	0.5	
Totals...	147	100	100	181	99.1	99.1	348	100	100



Graph V.—Distribution of deaf children in terms of years retarded or accelerated.

Graph V shows the distribution of cases for all the deaf and for the oral and manual separately arranged according to the number of years retarded or accelerated. If we call those more than one year accelerated supernormal, then we have 3.4 percent of the deaf pupils supernormal. There are 23.7 percent who may be considered equal to the average hearing child. These show just the same ability as the hearing child or test merely one year advanced or retarded. There are 32.6 who may be termed backward, that is from two to four years behind the normal hearing child. That leaves an unexpectedly large group of 40.3 per cent. who are over four years retarded. These we may term dull. Among this group there are no doubt many feebleminded, but we would not be warranted in drawing any such definite conclusions from the results of one test alone. An inspection of the group percentages for the oral and manual pupils taken separately shows a much larger percentage of the dull group among the manual pupils, a fact that is to be expected in the light of the previous comparisons of these two groups.

The results of this test seem to the writers to show the possibility of using class tests to compare in a general way the ability of different groups of individuals considered as groups. For a preliminary survey of an institution or school several class tests, for which reliable norms for comparative purposes exist, would seem to be excellent.[3]

[3] Since the above article was written, the writers have extended the scope of this work to include about one thousand cases and have used both the Digit-Symbol and the Symbol-Digit Tests. This work appears in the Psychological Review Monographs, Vol. XX, No. 3, Whole No. 87, under the title, "Learning Tests with Deaf Children."

PRESENT TENDENCIES IN EDUCATIONAL PSYCHOLOGY

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In the minds of many the claim that education as a college subject is to be termed a science is at present insufficiently supported. Many honestly believe that education in the very nature of things cannot become a science. Exact measurements of mental processes are quite impossible, and without such exactness "science" is a misnomer. If, however, one defines science as truth inductively investigated and carefully organized for the purpose of discovering and stating fundamental laws, then education has the right to this title, for this is exactly what is being attempted, especially in that branch of education called educational psychology. Once a smattering of *a priori*, philosophical theory and emotional exhortations based on traditional viewpoints—themselves the results of points of view held by prominent thinkers—education today is struggling away from untested authority into the laboratory where testing, investigation, experimentation are the main if not the only grounds adequate for educational theory and practice. Granting that at present much of this laboratory work is inexact and subject to constant revision, and admitting also that mental phenomena elude absolutely exact measurements, credit should be given for the conscientious attempts made to ascertain as accurately as present apparatus permits what are the laws of learning and how the educative process can best be realized in a reconstructed system of education. The modern point of view in education seeks to be scientific, *i. e.*, open-minded and receptive to demonstration and observation of enumerable cases or subjects. If the results are unsatisfactory this is doubtless inevitable even in those sciences called exact. Constant revision is the key-note of true science.

What is true of education in general has been true also of its closest ally, namely psychology. In many quarters psychology remains in the philosophical group. Teachers of philosophy are loath to agree to a breaking of partnership with this subject of psychology dear to Plato. On the other hand, psychologists who have succeeded in starting business for themselves, as it were, are equally unwilling to grant that *educational psychology* deserves independence. To classify psychology into eight or nine subgroups as is now customary seems after all to be purely arbitrary and convenient only for administrative purposes. Essentially there is only a difference of the field of application, and references to these various fields can be easily and adequately made in general psychology. To call educational psychology a distinct discipline or science is therefore looked upon by many as arrogant presumption.

But the fact that education forms one of the many fields of specific application of psychological truth and one of the most significant in the life of individuals and nations is reason enough to emphasize educational psychology as worthy of a distinct title. For this particular phase of the "science of mind" or of "behavior" deals with a select group of processes, and specialization is necessary, for the sake of economy of time at least, to investigate and organize the data here available. It is fundamentally important that experiments be made throughout the entire field of education. The problems of the school room and of the learner are peculiar to these phases of society. Experimental pedagogy is just as important and just as possible as experimental farming. Agriculture is distinct from biology and botany and chemistry but as a science it depends on data from all of them. Educational psychology is distinct from general psychology, biology, history and philosophy but it uses data from all of these departments of learning and in addition seeks to demonstrate in mathematical terms or graphs the results of investigations carried on in the school or under conditions similar to the school. The task is indeed herculean. Men like Meumann, Thorndike, Bagley and Whipple loom large in its evolvement.

But educational psychology, because a young science, is still insufficiently organized. There does not seem to be a general agreement as to its contents as over against the delimitations of

psychology in general. College and university courses in the subject are still largely the result of personal preferences on the part of the teacher in charge. Terminology is still confused. In order to ascertain the present tendencies as accurately as possible a questionnaire was sent to all of the teachers of educational psychology included in the membership of the Society of College Teachers of Education. The questions in the main asked for information on the following points:

1. Name of course, with number of semesters offered, principle method of teaching it, prerequisites, seminars offered, enrollment and name of authors and texts used in the respective courses.
2. Distinctly pedagogical laboratory equipment available.
3. List of sub-topics stressed in the courses taught.
4. Other subjects taught by teachers of educational psychology.
5. Conceptions of standard courses in this field and suggested minimum requirements, including specific prerequisites, for entrance upon courses in educational psychology.
6. Problems investigated in the seminar courses.

The questionnaires were filled out by fifty-three professors. Replies stating inability to supply the information requested or that no special courses in this subjects were offered came from fourteen. In all sixty-seven replies were received. The author takes this opportunity of acknowledging the courtesies shown him in this preliminary survey. Many of the correspondents evinced keen interest in the attempt to ascertain what is now being done in this subject and many expressed the hope that some definite effort might be realized for systematizing and standardizing educational psychology.

The foregoing subjects in some cases, as "Social and Moral Education," are not strictly psychological but they were so reported.

At Teachers College, Columbia University, courses in educational psychology include methods of teaching in special classes, supervision of special classes, observation, experiment and teaching in connection with special classes, psychology of childhood, psychology and treatment of exceptional children, applications of experimental and physiological psychology to education, educational psychology, psychology of the elementary

A. Tendencies among College and Universities

TABLE I.

Names of Courses in Educational Psychology

General Educational Psychology	45	Principles of Method for High School Teaching	2
Advanced Educational Psychology	5	Criticism and Supervision of Teaching	1
Genetic Psychology	16	Literature of Educational Method	1
Mental Tests	17	Modern Methods in Elementary Schools	1
Child Psychology	4	Psychology of Learning	1
The Learning Process	3	Method	1
Deficient Children	3	Psychology of Elementary Subjects	2
Principles of Teaching	1	Psychology of Elementary Subjects	1
Psychology of Adolescence	1	Principles of Education	3
Logic of Education	1	Practice Teaching	2
Social and Moral Education	1	Onthogenics	1
Elementary Educational Psychology	1	Eugenics and Euthenics	1
Mental Processes	1	Retardation and Elimination	1
Individual Psychology	1	Lecture Course on Memory Process	1
Psychology for Normal Teachers	1	Lecture Course on Reasoning Process	1
Laboratory Courses	6	Problems of College and University	1
Statistical Methods	2	Various Seminar Courses	8
Experimental Education	7		
Principles of Method for Elementary Teaching	1		

subjects, psychology of the secondary school subjects, application of analytic and genetic psychology to education, application of psychological and statistical methods to education, clinical psychology and courses in statistical methods.

The foregoing lists will be better understood after noting the sub-topics stressed in some of the courses.

TABLE II.

Sub-Topics in Educational Psychology

The Learning Process	11	Mental Tests	4
Memory	11	Individual Differences	6
Fatigue	7	Perception	3
Instinct	8	Transfer of Training	3
Attention	5	Reason	5
Habit	8	The Original Nature	4
Imagination	6	Correlation	3
Association	5	Psychology of special subjects	3

The following sub-topics are mentioned only once: Mental and Physical Hygiene, Feeling, Acquisition of Musical Skill, Physical Development, Work, Dependence of Mind on Body, Child Development, Play, Retardation, Conception, Volition, Suggestion. Sub-topics in general psychology as emphasized in connection with education and mentioned once by the respective correspondents are Infancy, Periods from the Standpoint of Neural Development, Play, Instincts, Animal Psychology, Child

up to School Age, Development from Infancy through Adolescence, Growth of Mental Power, Heredity, Individual Differences, The Learning Process, Abnormalities, Fatigue, Physical and Mental Development, The Abnormal Boy, Growth and Function, Development of Intellect, Development of Instincts, Application of Tests, Organic Evolution and Development, Mental Evolution (animal and human), Sensation, Expression, Control, Social Psychology, Sensory Discrimination, Memory and Memory Images, Evidence of Reasoning, Evidence of Consciousness, Child Study, Development of Special Functions, Social and Moral Development.

The main courses offered under the general title of educational psychology stress the following sub-topics. *Experimental Pedagogy*—psychology of testing, technique of Binet tests, new tests, elementary school subjects, educational measurements, study of inductive literature of psychological processes involved, testing results. *Advanced Educational Psychology*—individual differences, mental inheritance and correlation, original nature of man, psychology of learning, social psychology. *Experiments in Educational Psychology*—Starch's Manual, acquisition of habits, memorization, association, intellectual tests, economics of learning, types of learning. *Mental Tests*—Retardation, Binet Tests, mental and physical tests, defective and exceptional children, Whipple's Manual, perception and reasoning. *Logic of Education*—Psychology of attention, interest, thinking, age differences and development, individual differences. *Social and Moral Education*—Psychology of character, age differences and development, application of pedagogical method.

Seminar Course in Educational Psychology are being devoted to research in the following fields: attention, individual differences, Binet tests each year in the elementary school, mental levels, practice error in short hand, principles of marking pupils, scales, the learning process, moral deficiency, school processes, fatigue, mental deficiency, blood pressure, locomotive guidance, adolescent psychology, border cases, psychology of secondary subjects, educational measurements, mental tests, effect of the Curtis practice series in arithmetic, coefficients of correlation, attention in advertisements, operation of secondary laws of association, how students study, endowments, pediatrics, applicability of standard tests, practice effect of learning, eye movements,

standardization of school and mental tests, criticism of mental and physical development, age standards in mental tests, study of "opposite" tests, completion tests, age standards in writing, retardation and elimination.

The foregoing survey, while lacking in completeness, embraces forty of the institutions offering courses in educational psychology in this country. One observes considerable confusion in terminology, courses doubtless similar in content bearing titles quite dissimilar. The subtopics are distributed according to the individual instructors' conception of the course. There seems to be lacking a universal agreement on the contents of educational psychology in general or any of its large branches in particular. The field is defined arbitrarily and titles are used as labels for "all-spice" courses. But from this mass of topics it may be worth while to state the following

Summary—Educational psychology as now taught in the colleges and universities of this country embraces chapters on the learning process with special emphasis on memory processes included under various terms and involving association, perception, imaging, attention and to a less degree chapters on the higher thought processes of thinking and reasoning. Considerable time is devoted to the study of mental development by stages or by age. The original nature of the individual including endowments, instincts, capacities with habit formation is given considerable attention, and is adding to the significance of the doctrine of individual differences. This study of normal endowment is supplemented by courses on defective and exceptional children with the intimately related problem of retardation. No small amount of time and effort is devoted to the psychology of school subjects and the application of its principles in supervised methods of teaching. The numerous courses on statistics evince a growing tendency to reach as high degree of accuracy in measuring and stating results as may be possible in this type of scientific work. One senses throughout the confusion of titles and terminology a wholesome movement toward a well defined field of investigation and the possibility of eventually standardizing the general conception of educational psychology.

B. Administration of Courses in Educational Psychology

TABLE III.

Others Subjects taught by instructors in Educational Psychology

Philosophy	10	Comparative Psychology	1
Logic	1	Hygiene of Instruction	1
Ethics	4	School Administration	2
History of Education	9	School Hygiene	3
Psychology	9	Education	4
Secondary Education	2	Applied Psychology	1
Education in U. S.	1	School Management	1
Principles of Education	3	Philosophy of Education	2
Pedagogy of High School Subjects	2	Adolescent Psychology	1
Genetic Psychology	1	Educational Theory	2
Experimental Pedagogy	1	Primary Education	1
General Methods	3	Psychotherapy	1
Experimental Psychology	4	Educational Sociology	1

In seventeen institutions the "professor of education" is a distinct chair, in twenty-eight the chair is not distinct.

It should be noted that in the table the subjects taught in addition to educational psychology are very closely related to this field. Philosophy still claims education as its own in fifteen of the institutions replying. The groupings in the table are, it would seem, quite logical and the additional subjects might well serve as fields of applied educational psychology in which the principles of the main subject may receive concrete and vital illustration and realization in reformed methods.

Prerequisites.—There is a strong tendency to make general psychology a prerequisite to courses in educational psychology, thirty institutions still making this requirement. In this connection the comments of three or four professors in educational psychology are significant. Professor Colvin writes:

"A course in general psychology is desirable though not absolutely necessary. Prerequisites in education are not as a rule necessary though local conditions may make them desirable."

Other comments are more strongly opposed to prerequisites in general psychology as now taught. Professor Kohl says:

"General psychology should be a prerequisite but I am not so certain that it counts very much as usually given with the emphasis so much on sensation and the nervous system. I am feeling more and more that a vital course in biology would be a greater help."

Professor V. A. C. Henmon writes:

"I have a feeling that there would be a gain if those who intend to take educational psychology should take general psychology in the department of educational psychology. A better articulation of the work would result."

Professor Chase of the University of North Carolina writes:

"It is my good fortune to teach elementary psychology as well as the educational psychology. I do not believe, however, that the two courses can be fused and was very much surprised to see in some of the replies published this month (March) in the *Psychological Bulletin* that a number of teachers were in favor of such a union. Pure psychology and educational psychology, to my mind, require different methods of treatment, different subject matter, different points of view. The approach must be different, as must be the approach to pure and applied science anywhere. I have wrestled with the question whether pure psychology should be required as a prerequisite for educational psychology and have finally come to the conclusion that it should not."

The suggestion that courses in biology be substituted for prerequisites in pure psychology deserves careful consideration. The chief advantage in pursuing the latter lies doubtless in the acquaintance offered the student with terminology and general contents of psychology. The same advantage, however, results from a well organized course in educational psychology if care is taken to explain terms clearly and without too much reference to the many theories concerning psychological terms. Confusion results frequently when students of pure psychology begin the study of education. The point of view is wholly different and it becomes necessary in all too many cases for the student to unlearn what he laboriously tried to glean from the prerequisite course. With the prevailing trend of functionalism or behaviorism in education prerequisites in biology are more essential than general psychology, which all too often is limited to the philosophical or introspective method.

There is a wide range of practice relative to class or semester requirements, but the replies are based on local meanings of administrative terms in many instances, making it difficult to draw conclusions. There seems to be, however, a tendency to require a whole year of general psychology as an introduction to educational psychology. In six institutions experimental psychology is required instead of general psychology. Within the field of educational psychology practically every institution giving information on this point requires general educational psychology as a prerequisite to other courses in this broad field. There does not seem to be a very general requirement that students of methods of teaching have had courses in educational psychology. It is difficult to understand how any teacher can adequately employ correct methods of teaching without knowing something of the underlying principles of the method. Methods

tend to degenerate into mechanical devices and monotonous routine unless consciously evolved from a knowledge of the learning process.

Last year there were offered sixty-one one semester courses, forty-one two semester, two three semester, three one or two semester, one one and a half semester and two six semester courses in the several courses listed under Educational Psychology. Twenty-two hundred and fifty-nine students were enrolled in undergraduate courses and three hundred fifty-six in the graduate department.

Summary.—The administrative phases referred to indicate that at present General Psychology is regarded as the essential prerequisite to courses in educational psychology. Here and there are suggestions that biology take the place of the prevailing prerequisite. Professors of educational psychology teach closely related subjects, but several are still dividing their time with philosophy. One semester courses prevail. The enrollment in undergraduate and graduate courses last year indicates a most encouraging interest in this new science.

C. Methods of Teaching

The following table is not intended to be exhaustive. It simply lists the various texts that are used either exclusively or for reference purposes. Other books are referred to also but these were mentioned as the more important.

Table IV. Texts Used in Educational Psychology

Author	*Text*	*Number Using*
Colvin	The Learning Process	11
Thorndike	Educational Psychology (Brief Course)	8
	Educational Psychology, Vol. I	3
	Educational Psychology, Three Volumes	3
	Principles of Education	1
	Mental Measurements	9
Pyle	Outlines of Educational Psychology	6
Bolton	Principles of Education	5
Starch	Experiments in Educational Psychology	4
Parker	Methods of Teaching in High Schools	4
Kirkpatrick	Fundamentals of Child Study	4
	Genetic Psychology	3
Rusk	Introduction to Experimental Education	3
Bagley	The Educative Process	3
Whipple	Mental and Physical Tests	3
Meumann	Psychology of Learning	2
Judd	Genetic Psychology	2
Pillsbury	Essentials	2
Angell	Psychology	2
James	Talks to Teachers	2
Horne	Psychology of Education	2

The following texts are mentioned once: Henderson, Principles of Education; Ross, Social Psychology; Munsterberg, Psychology and the Teacher; Holmes, Conservation of the Child; Dewey, How We Think; Baldwin, Physical Growth and School Progress; Colvin and Bagley, Human Behavior; Ladd, Outlines of Descriptive Psychology; Kirkpatrick, Individual in the Making; Baldwin, Mental Development; Oppenheim, Development of the Child; Sully, Studies of Childhood; Sandiford, Mental and Physical Life of School Children. Various articles by Woodworth, Hollingworth, and Cattell and Valentine are referred to. Books by Stein and Breitweiser are mentioned but not by titles.

In forty-eight institutions the sole method of teaching mentioned is lecturing. In eleven, lectures and laboratory, in five, laboratory principally. In sixteen institutions there is a well equipped laboratory, including full sets of the Whipple material and Binet tests. Five institutions mention the school system as their laboratory. The lack of laboratory equipment is in itself serious but unless the instructor in charge has had efficient training in the technic of such pedagogical apparatus it probably is better to do without any laboratory whatsoever. Doubtless much harm has been done by inexperienced experimenters attempting to use, for example, the Binet tests. For the present, at least, it seems important to distinguish between the theoretical educational psychologist and the laboratory expert. Eventually the former and the latter should be one and the same person if the subject is to attain its scientific standards.

Summary.—Colvin's The Learning Process is mentioned by eleven institutions and Thorndike's several texts twenty-four times. It probably is unfair to draw any fixed conclusions in this connection but it would seem that last year Thorndike and Colvin texts were used more extensively than other texts in this field. The lecture method prevails. Well equipped laboratories are available in about one-third of the institutions.

D. Conceptions of Standard Courses in Educational Psychology

Replies to this section of the questionnaire cover a wide range of opinion. No two correspondents agree. The reader will

appreciate the problem of standardizing this subject when he glances over the following suggestions:

Should be based on ground work of experimentation and observation. Include applications of instincts, capacities, habits, types of learning—memory, thinking process, feeling with more consideration of experimental results.

Brief introduction to genetic psychology followed by more thorough study of instincts, habit, memory, etc.

One semester of child psychology and one of adolescent psychology.

Consist of laws of mental development and facts related to methods according to which mature mental processes function in educational applications.

Consist of a three hour course in general educational psychology, a three hour course in general psychology and special courses in individual differences with emphasis on psychology of school subjects.

Should cover analysis of the learning process with experimental results gained from experiments in the field of habit, memory, association and imagination.

One year of general and educational psychology combined and a second year in psychology of adolescence, mental defectives and graduate courses in same general field.

The point of view should be prevailingly genetic.

One year of theoretical discussions supplemented by practical tests.

Experiments in the learning process and a good text and lecture course.

Introductory general psychology, introductory educational and genetic psychology with advanced and graduate courses.

Laws of growth and the educative process.

Reasonable analysis of the child mind and life, the nature and purpose of the school, various methods of teaching based on psychology of learning and of school subjects.

The foregoing suggestions should be enriched by a few citations of methods found successful in some schools. Colvin at Brown University offers a one semester undergraduate course to seniors followed by a practical course in "Introduction to Secondary Teaching" with observation and some slight practice. In this second course the more general principles of the

first course are given practical application. A graduate course is offered consisting of laboratory work, readings, discussions and problems under school conditions. Kohl of Mount Holyoke writes:

"I have had the best success the past year I have ever had. My students all go out to teach in small high schools. I have visited more than 200 classes in high schools the past year and I take actual concrete school situations and present them to the classes to psychologize. This has given vitality to the work and puts the students face to face with applying psychology to problems which they are to meet daily in teaching. It is a very difficult matter to get the material, but it counts."

Davidson of Leland Stanford writes:

". . . the subject should be so arranged and presented that it should not merely offer a 'point of view' but rather a substantial basis for teaching and educational practice. To this end each sub-division of the subject should turn upon the study of one main type of mental process and this be prosecuted with thoroughness especially with reference to age differences and pedagogical applications after the ground has been covered in more general courses. When this is done the student should be ready for the details of pedagogical technique in advanced courses in mental testing and experimental pedagogy. The work would then have three phases: first, as introduction to psychology, educational and genetic; then the substance of the subject in about four or five semester courses either contemporaneously or in sequence, and finally the drill in the application to mental testing and pedagogical practice. I assume that laboratory practice and statistical method will be taken care of either incidentally or in separate courses. All of this is with reference to students who will be educators, that is either supervising school officers, normal school instructors or college instructors in education, and of course educational investigators. For secondary teachers the course could probably at present not be so thorough and would have to be adapted, but still with reference to the same three phases."

Davidson suggests also that courses in education should be differentiated according to the type of educator in view, and that with such an organization in mind the subject matter even of educational psychology would vary with the class of students being prepared.

J. Carleton Bell of Texas and Terman of Leland Stanford emphasize the need of stressing the behavior point of view in educational psychology. Hints of the same attitude are scattered throughout several replies.

Summary.—The various suggestions regarding standard courses indicate strongly that the learning process should form the backbone of the course and that there should be constant application of this process in laboratories or in the school system. That is, the trend as expressed in these suggestions is purely scientific. The learning process is to be studied experimentally not *a priori*, and the field of experimentation is preferably the school system where conditions are normal for scientific investi-

gation. There is of course no end of difficulties to be faced in articulating with the public school system, but difficult as the situation is there is no other wholly adequate means of arriving at pedagogical truth. The suggestion of arrangement of courses in educational psychology with sequence and correlation of subjects seems to follow that in actual practise. Whether or not the present organization is the best possible deserves free discussion at a representative conference of instructors in this field.

E. General Conclusions

In the beginning of this article it was stated that education and especially educational psychology claims to be a scientific subject because it prosecutes courses by means of experimentation and investigation. The questionnaire correspondence reported in the preceding pages supports this claim. A few general conclusions are quite obvious.

1. There is no general agreement on terminology or on the structure of courses in educational psychology. There should be some standardizing agency to bring about uniformity in these respects.

2. In general, courses include the study of the learning process with special attention to instincts, habit formation, imaging with particular reference to memory, association, thinking. School subjects are being analyzed psychologically. "Individual differences" are receiving much attention in connection with the study of exceptional children and the problem of retardation. The science of measurements is included as the *sine qua non* of accuracy in experimentation and investigation.

3. In seventeen institutions educational psychology is a distinct chair. In twenty-eight institutions the chair is combined with other subjects.

4. The most popular subject-combination is philosophy and education but there is noticeable a logical correlation, in the majority of cases, between educational psychology and other subjects taught by the same instructor.

5. General psychology prevails as a prerequisite to educational psychology. In this connection certain administrative problems appear important:

a. Will a prerequisite course in general psychology, interpreted on a purely introspective basis, serve adequately as an

introduction to a course in educational psychology interpreted functionally and taught experimentally?

b. To what extent is it possible in the transfer of credits from school to school to recognize one type of psychology as taught elsewhere and offered as prerequisite to or in place of certain educational psychology courses in another school? In other words, should the mere time value (units) of a prerequisite suffice as now seems to be the only feasible method?

c. Should not courses in educational psychology serve a purpose so specific, that, unless the general courses in pure psychology are equally specific, there must be a distinct type of psychological propaedeutic to unify and make logical the advance from elementary to higher studies in this field? Is pure psychology *per se* a sufficient introduction to educational psychology as a study of specific applications?

d. May it not become necessary to have as prerequisites to educational psychology a distinct type of introductory psychology which deals with only those problems that require in higher courses a fuller and pedagogical treatment?

e. The suggestion that biology be substituted for general psychology as a more logical and helpful introduction to educational courses deserves careful consideration.

6. One semester courses in educational psychology predominate.

7. Texts by Thorndike and Colvin are used most frequently.

8. The lecture method is most popular, but in several institutions this is supplemented by laboratory methods.

9. In about one-third of the institutions there are fully equipped pedagogical laboratories.

10. Conceptions of standard courses stress the importance of experimentation, specific problems, application of the principles and laws of the learning process in school work, the differentiation of courses according to the type of "educator" in view.

11. In spite of much confusion of terminology and organization of courses there is evident a strong trend toward a well defined science of educational psychology. It is impossible to predict exactly what its standardized contents will eventually be. It is altogether possible, however, that the organization now in vogue will form an important basis for modification and elaboration.

THE MEASUREMENT OF ACHIEVEMENT IN ENGLISH GRAMMAR

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The measurement of achievement in English Grammar may be attacked from two angles. We may proceed to measure knowledge of formal grammar on the one hand, or ability to use the English language correctly on the other. I have attempted to prepare measurements for both phases. Scales for measuring usage will be described first and the tests for knowledge of technical grammar afterwards.

Scales for Measuring Usage

In measuring any complex of mental functions, such as those involved in a school study, it is important to determine the essential factors in it. The two chief elements of usage, aside from composition, are undoubtedly grammatical correctness and punctuation. I shall present first the scales for measuring grammatical correctness and then discuss their derivation, advantages and limitations. The scale for punctuation will be considered immediately afterwards in a similar manner.

Grammatical Scale A[1]

Each of the following sentences gives in parenthesis two ways in which it may be stated. Cross out the one that you think is incorrect or bad. If you think both are incorrect cross both out. If you think both are correct underline both.

Step 5

1. It was so misty we (could hardly; couldn't hardly) see.
2. The gazette reported (he; him) to be dead.
3. He was a patriot, but all the rest (were traitors; traitors).

Step 6

1. On the way we met a Mr. Osborn from the neighborhood of Denver, (and who; who) had the typical western breeziness.
2. Gravity is (when a stone falls; a force that causes a stone to fall) to the ground.
3. I can do it as well as (they; them).
4. It is (me; I).

[1] Copies of this scale and of the other tests mentioned in this article for purposes of measuring classes and schools may be obtained from the author.

Step 7

1. A fireman seldom rises above (an engineer; the position of an engineer).
2. The difference between summer and winter (is that; is) summer is warm and winter is cold.
3. He is happier than (me; I).
4. They are (allowed; not allowed) to go only on Saturdays.

Step 8

1. (In; as I was) talking to Smith the other day, he told me about the race.
2. (When I was; when) six years old, my grandfather died.
3. You must not cut the cake until (thoroughly cooked; it is thoroughly cooked).
4. I shall always remember the town because of (the good times I had; the good times) and the many friends I made there.

Step 9

1. It tastes (good; well).
2. Send (whoever; whomever) will do the work.
3. (Who; whom) do you mean?
4. You (will; shall) not stir; I forbid it.

Step 10

1. I intended (to answer; to have answered).
2. I met many people there whom I had seen before (but did not know their names; whose names I did not know).
3. I (will; shall) help you; I promise it.
4. Having come of age, (I took my son; my son entered) into partnership with me.

Step 11

1. It was not necessary for you (to have gone; to go).
2. There were some people (whom; about whom) I could not tell whether they were English or American.
3. He came home with an increase in weight, but (hard work soon reduced it; which hard work soon reduced).
4. A different set of knives and forks (was; were) put on the table.

Step 12

1. The sheets of tin are laid in rows, (and care is taken; with care) that all the sheets fit snugly.
2. (Lincoln's assassination; the assassination of Lincoln) was a great tragedy.
3. He is (not only discourteous; discourteous not only) to the students but also to the teachers.
4. He had no love (or confidence in his employer; for his employer and no confidence in him).

Step 14

1. The man (whom; who) I thought was my friend deceived me.
2. (He sprang; springing) to the platform on which the dead man lay (and shouted; he shouted).
3. (Shall; will) you be recognized, do you think?

Step 15

1. They returned at night without any (one's; one) seeing.

Step 16

1. A man who (would; should) do that would be hated.
2. Do you (expect ever; ever expect) to go again?

Name..... Date.....

School..... Grade.....

City.....

Scoring the tests. The scale is composed of a series of increasing steps of equal differences of difficulty. A pupil's rating on the scale is the highest step passed and a step is passed if not more than one of the four sentences is missed. In case a pupil passes all the steps up to a certain point and then fails on one but passes additional steps beyond that point he is credited with all the additional steps passed. For example, if a pupil passes all steps up to and including the 8th and fails on all beyond the 8th, his score will be 8. But if he fails on the 9th, passes the 10th, and then fails on the rest, his score will be 9. He is credited with all additional steps passed. This sort of record occurs about once in five and is due to the fact that there are only four sentences in each step. If there were ten or twelve sentences in each step such a record would rarely, if ever, occur. The reasons for regarding a step passed if 3 of the 4 sentences are marked correctly, that is 75 per cent. of them, will be obvious to all who are familiar with the principles underlying the psychological methods of measuring thresholds.

Derivation of the Scale. Grammatical scale A was derived experimentally by preparing a test sheet containing 100 sentences of a nature similar to those in the scale. A test was then conducted with over 1000 pupils in six schools in various parts of the country, distributed about evenly through the upper four grades, the four years of the high school and the university. These tests were scored and tabulated to show the percentage of times each sentence was marked correctly.

On the basis of these percentages of correctness the sentences for scale A were selected as follows. In order to obtain equal increments in difficulty in the successive steps, it is obvious that if human traits are distributed according to the law of chance, the sentences for each step will have to be selected so that the percentage of correctness for the various steps will conform to the normal probability distribution. Equal differences in the percentage of correctness would not produce equal differences in difficulty. A series of sentences having a percentage of correctness of 90, 80, 70, 60, 50, 40, 30, 20, 10, would not be separated by equally difficult steps. The steps in the middle of the scale would be much smaller than those at the ends. For example a sentence marked correctly by 45% of the pupils would not represent as large an advance in difficulty over one marked cor-

rectly by 50% of the pupils as the advance represented by a sentence marked correctly by 10% over one marked correctly by 15% of the pupils. The latter step would be approximately three times as large as the former. An objective scale for measuring mental capacities which shall be comparable to a linear scale or a scale of weights, must have equal steps.

On this basis and according to the values of the probability integral, the required percentages of correctness were computed so that the differences in difficulty between any two steps would be equal to the difference in difficulty between any other two steps. Four sentences marked correctly by 62.5% or very close to that, were arbitrarily designated as step 10, the middle point on the scale. The completed scale would have 20 steps ranging from 0 to 20. 50% of correctness should normally have been selected for step 10 since that is the median point of the curve, but in the particular form of the directions given at the head of scale A, a sentence would be marked correctly by pure chance once in 4 times. Hence we must assume that the zero point is 25% correctness and that 62.5% is the middle point on the range from 25% to 100%. Values for the remaining steps were then computed to be as follows:

Step	4 equals	95.1%	correct
5	"	92.9%	"
6	"	89.4%	"
7	"	84.5%	"
8	"	78.5%	"
9	"	70.7%	"
10	"	62.5%	"
11	"	54.3%	"
12	"	46.5%	"
13	"	40.5%	"
14	"	35.9%	"
15	"	32.1%	"
16	"	28.5%	"

Four sentences, which conformed to the required percentages of correctness for each step, were selected and arranged in the form of scale A. The sentences, of course, do not have absolutely these values but they were selected to conform as closely as possible. In no case, however, does a sentence deviate more than .2 of a step from its required value. The scale runs down only as far as step 5 because there were no sentences in the original test blank sufficiently easy to fit the required percentages of correctness for lower steps. Some of the upper steps have

fewer than four sentences because there were not enough sentences of correctness for lower steps. Some of the upper steps have fewer than four sentences because there were not enough sentences of the proper degree of difficulty to fit into these higher steps. The scale, however, as it stands is sufficiently easy at the lower end to measure adequately the ability of pupils in the lower grades and sufficiently difficult at the upper end to measure adequately the ability of university seniors.

Advantages, Limitations and Improvements of the Scale. The advantages of the scale are those of definiteness, objectivity, comparability, and convenience of measurement. The scoring can be done quickly. With the help of a key, any person, who may know nothing about grammar or correct usage, can score the tests as well as a linguist can. After a few papers of a given class have been scored, it becomes unnecessary to look through the entire test as the examiner will know approximately at what part of the scale to look. If a pupil has failed on two successive steps, it is likewise unnecessary to look any further, as he will not pass any steps beyond that point.

The limitations of the scale are the incompleteness of the steps at the upper and lower ends and the fact of having only four sentences for each step. The former limitation is of minor importance since the scale in its present form is sufficiently extensive to measure a very wide range of ability. The scale will be extended at both ends by further experimentation so as to add sentences of the required degrees of difficulty.

The second limitation can be overcome experimentally by finding additional sentences for each step. This has been done by preparing scales B and C with corresponding steps of identical degrees of difficulty. Scales B and C were constructed by the same process as scale A. The sentences in scales B and C, however, do not fit into their respective steps as accurately as those in scale A. While each group of 4 sentences as a whole is very nearly identical in difficulty with the corresponding steps in scale A, some individual sentences deviate .3 of a step from the specified values.

GRAMMATICAL SCALE B

Each of the following sentences gives in parenthesis two ways in which it may be stated. Cross out the one that you think is incorrect or bad. If you think both are incorrect cross both out. If you think both are correct underline both.

Step 7

1. I feared you (should; would) fail.
2. Any man who could accomplish that task, the whole world would (think he was a hero; regard as a hero).
3. He had to earn money (that is; is) the reason he stayed out of college.
4. He went to school (thereby; and thereby) improving his mind.

Step 8

1. The fact that I had never before studied at home, (I was at a loss; made me feel at a loss as to) what to do with vacant periods.
2. Both are going,—(he and she; him and her).
3. I don't believe I (will; shall) be able to go.
4. It is (the handsomest vase I almost; almost the handsomest vase I) ever saw.

Step 9

1. We ate such a dinner as only laborers (can eat; can).
2. He was deaf, (caused by; as the result of) an early attack of scarlet fever.
3. I asked what were the names of her puppies and (kitten; her kitten).
4. Every one opened (his; their) window.

Step 10

1. The captain, as well as the mate and the pilot, (was; were) frightened.
2. (That's all I want, is a chance; that's all I want—a chance) to test it thoroughly.
3. He is the tallest of (all the men; any man) in the regiment.
4. (I walked out into the night as the moon rose; as the moon rose, I walked out into the night) and wandered through the grounds.

Step 11

1. There we landed, and having eaten our lunch (the steamboat departed; we saw the steamboat depart).
2. (After pointing; when he had pointed) out my errors, I was dismissed.
3. The question of (whom; who) should be leader arose.
4. He spoke to some of us,—namely (she and I; her and me).

Step 12

1. It has no relation (to; as to) time or place.
2. He left for Pittsburgh on Thursday (arriving; and arrived) there on Sunday.
3. Fostoria is as large (if not larger than Delaware; as Delaware, if not larger).
4. He kept it (safe; safely). (That is, through his keeping, it was safe.)

Name.....Date.....

School.....Grade.....

City.....

GRAMMATICAL SCALE C

Each of the following sentences gives in parenthesis two ways in which it may be stated. Cross out the one that you think is incorrect or bad. If you think both are incorrect cross both out. If you think both are correct underline both.

Step 7

1. The life of a hod-carrier is sometimes happier than (a prince; that of a prince).
2. (There were two hundred; two hundred) students went.
3. He wrapped it (tight; tightly). (Referring to the manner of wrapping).
4. He did what many others (have; have done) and are doing.

Step 8

1. The fire was built and the potatoes (baked; were baked).
2. I was detained by business (is; that is) the reason I am late.
3. The difference between them (is; is that) De Quincey is humorous and Macaulay is grave.
4. (Shall; will) you do the deed?

Step 9

1. The box, including the apples, (were; was) lost.
2. Oak, brass, and steel (is; are) the material of the structure.
3. The ball is thrown home by a player (stationed in the middle of the square called the pitcher; called the pitcher, who is stationed in the middle of the square).
4. I paddled the boat for a while, (then; and then) fell into a reverie.

Step 10

1. If they (would; should) find it, I should rejoice.
2. One or the other of those fellows (have; has) stolen it.
3. I went there in order to (inspect it personally; personally inspect it).
4. They would neither speak to him (nor would they; nor) look at him.

Step 11

1. A new order of ideas and principles (have; has) been instituted.
2. Every morning I take a run (and immediately afterward; followed by) a shower bath.
3. (The benefactor of mankind; mankind's benefactor) is honored by all.
4. (Who; whom) did you say won?

Name.....Date.....

School.....Grade.....

City of.....

The advantage in the three scales is that whenever a more accurate measurement is desired than that afforded by a single test, more than one scale may be used and an average of the scores taken.

Another advantage in having several commensurate scales is the measurement of progress of the same class of pupils from time to time by using a different scale each time. As a matter of fact, progress may be measured very accurately by using the same scale at different times provided that no drilling or coaching on the scale is done. Without specific instruction on the material of the scales, they may be used repeatedly with the same class without appreciable error. The following situation illustrates how little effect even definite knowledge of the correctness of the various sentences has upon the results of repeated tests. A class of 65 university juniors and seniors went through the test and scored, according to a key, their own papers and from 6 to 10 other papers each. Three weeks later the test was repeated with the result that the average score of the class was

only half a step higher than it had been in the first test. When specific knowledge about the material of the scale produces so little difference after only three weeks, it seems very improbable that the performance of the test without further reference to it will have any appreciable effect whatever upon a repetition of the test after an interval of several weeks or months.

Standards of Attainment. On the basis of tests made in four schools, the following tentative standards of attainment for June of the respective years have been obtained.

			High School				College
Grade....	7	8	F.	So.	Jr.	Sr.	Jr.
Score.....	8.0	8.3	8.6	8.9	9.2	9.5	10.3

Punctuation Scale A

The scale for punctuation was derived by a process of experimentation and computation entirely identical with that by which the grammatical scales were derived. The original test with a larger set of sentences was made with the same groups of pupils as the grammatical test. The number and percentage of times each sentence was punctuated correctly was then computed and the selection of sentences for the scale was made also according to the distribution of the probability curve. In this computation, however, the 50% point was taken as the middle point instead of the 62.5% point since the element of chance does not enter here as in the case of grammatical scale. The sentences for the various steps were selected according to the following percentages of correctness:

Step			
4	equals	93.5%	correct
5	"	90.5%	"
6	"	85.9%	"
7	"	79.3%	"
8	"	71.3%	"
9	"	61.0%	"
10	"	50.0%	"
11	"	39.0%	"
12	"	28.7%	"
13	"	20.7%	"
14	"	14.1%	"
15	"	9.5%	"
16	"	6.5%	"

Punctuation Scale A

Punctuate the following sentences.

Step 6

1. We visited New York the largest city in America.
2. Everything being ready the guard blew his horn.
3. There were blue green and red flags.
4. If you come bring my book.

Step 7

1. I told him but he would not listen.
2. Concerning the election there is one fact of much importance.
3. The guests having departed we closed the door.
4. The train moved swiftly but Turner arrived too late.

Step 8

1. Last year I studied grammar history and geography.
2. Next we went to Vienna the capital of Austria.
3. But alas this was not the case.
4. Ever since Betty has loved the flag.

Step 9

1. He was satisfied I suppose with his situation.
2. A faithful sincere friend is prized highly.
3. The present situation however is very different.
4. Our national Capitol situated in Washington is a magnificent building.

Step 10

1. A tall square building is located on State street.
2. Washington Irving whose personality was genial and charming became very popular in England.
3. You see John how I stand.
4. On the path leading to the cellar steps were heard.

Step 11

1. Paris Illinois is a smaller city than Paris France.
2. He asked what is the matter.
3. I like to work he said especially in the morning.
4. Chicago Illinois is a large city.

Step 12

1. When thou goest forth by day my bullet shall whistle past thee when thou liest down by night my knife is at thy throat.
2. Oh come you'd better.
3. The President bowed then Hughes began to speak.

Step 13

1. I saw no reason for moving therefore I stayed still.
2. There are three causes poverty injustice and indolence.

Step 14

1. He said that he had lent his neighbor an ax that on the next day needing the ax he had gone to get it and that his neighbor had denied borrowing it.

Step 16

1. As in warfare a band of men though strong and brave individually is collectively weak if it is not well organized so a speech a report an editorial an essay any composition though its parts may be forcible or clever is weak as a whole if it is not well organized.

Name.....Date.....

School.....Grade.....

City.....

The scoring is done in the same manner as with the grammatical scales. A step is passed if at least three of the four sentences are punctuated correctly. If any mark is inserted incorrectly or is missing, the entire sentence is considered a failure.

With regard to use, advantages, limitations, and improvements of the punctuation scale, the statements made in connection with the grammatical scales apply here equally well, and hence need not be repeated.

The following are tentative standard scores of attainment for June of the respective school years.

			High School				College
Grade....	7	8	F.	S.	J.	S.	J.
Score.....	8.0	8.3	8.6	8.9	9.2	9.5	10.3

Tests for Measuring Grammatical Knowledge

Technical knowledge of grammar is perhaps more difficult to measure than usage on account of its complexity. Adequate tests should cover the chief parts of the field. Three types of tests will be described. They are not complete for all phases of grammar but they measure several important divisions.

English Grammar Test 1. Score

Indicate the parts of speech in the following text by placing above each word the abbreviation for its part of speech. Work as rapidly as possible. Three minutes will be allowed. Use the following abbreviations.

noun—n	verb—v	conjunction—c
pronoun—pro	adverb—adv	interjection—i
adjective—adj	preposition—pre	

Maggie's eyes had begun to sparkle and her cheeks to flush—she was really beginning to instruct the gypsies and gaining great influence over them. The gypsies themselves were not without amazement at this talk, though their attention was divided by the contents of Maggie's pocket, which the friend at her right hand by this time emptied without attracting her notice.

"Is that where you live, my little lady?" said the old woman at the mention of Columbus.

"Oh, no!" said Maggie, with some pity; "Columbus was a very wonderful man who found out half the world, and they put chains on him and treated him very badly, you know—it's in my catechism of geography but perhaps it's rather too long to tell before tea."

"Yes, my home is pretty, and I'm very fond of the river where we go fishing; but I'm often very unhappy. I should have liked to bring my books with me, but I came away in a hurry, you know. But I can tell you almost everything there is in my books, I've read them so many times, and that will amuse you. And I can tell you something about geography, too—that's about the world we live in—very useful and interesting."

Name..... Date.....

School..... Grade.....

City.....

This test is scored by determining the number of words designated correctly. In case of a word which may be designated

differently, it is counted correct if it is permissible according to good authority. For example, Maggie's is considered correct if it is marked either as noun or as adjective.

The following are provisional standard scores of achievement for the ends of the various school years.

			High School				College
Grade	7	8	F.	S.	J.	S.	S.
Score	30	33	36	40	43	46	60

ENGLISH GRAMMAR TEST 2. SCORE

Indicate the case of each noun and each pronoun in the following text by placing above each one the abbreviation for its case. Work as rapidly as possible. Three minutes will be allowed. Use the following abbreviations:

nominative—n possessive—p objective—o

After crossing the gully and walking on through the woods for what they thought a safe distance, they turned into the path. They were talking very merrily about the General and Hugh and their friend Mills, and were discussing some romantic plan for the recapture of their horses from the enemy, when they came out of the path into the road, and found themselves within twenty yards of a group of Federal soldiers, quietly sitting on their horses, evidently guarding the road.

"Where are you boys going?" he asked, as he came up to them.

"Going home."

"Where do you belong?"

"Over there—at Oakland," pointing in the direction of their home, which seemed suddenly to have moved a thousand miles away.

"Where have you been?" The other soldiers had come up now.

"Been down this way." The boys' voices were never so meek before. Each reply was like an apology.

"Been to see your brother?" asked one who had not spoken before—a pleasant looking fellow. The boys looked at him. They were paralyzed by dread of the approaching question.

"Now, boys, we know where you have been," said a small fellow, who wore a yellow chevron on his arm. He had a thin mustache and a sharp nose, and rode a wiry, dull, sorrel horse. "You may just as well tell us all about it. We know you have seen them, and we are going to make you carry us where they are."

Name..... Date.....

School..... Grade.....

City.....

This test is scored by determining the total number of nouns and pronouns designated correctly. The following are provisional standard scores.

			High School				College
Grade	7	8	F.	S.	J.	S.	S.
Score	13	16	20	23	26	30	45

ENGLISH GRAMMAR TEST 3. SCORE

Indicate the tense and the mode of the following verb forms by placing above each example the abbreviation for its tense and mode. Work as rapidly as possible. Three minutes will be allowed. Use the following abbreviations.

present—pr.
past—pa
future—fu
present perfect—pr. p.
past perfect—pa. p.
future perfect—fu. p.
indicative mode—in.
subjunctive mode—su.
imperative mode—im.

If a verb has the present tense and the indicative mode, place above it pr. in.

I wait. I will have cut. You talked. If you become. He will think. If he wished. We have played. Break the stick. They had shown. I stayed. If I drink. You will look. If you found. He has walked. Do your work. We had spun. We cry. They will have run. I will grow. If I punished. You have seemed. Wear your hat. He has. He had called. We will have slept. If they begin. We gave. I have eaten. Seek your pencil. You had seen. He spoke. He will have fallen. We will take. If we drive. If they drew. You depart. They sell. I had flown. They bought. You will have been. They will swim. If he go. They have stolen. If we bit. Lift your hat.

Name..... Date.....

School..... Grade.....

City.....

A tense or a mode given correctly counts as one point each. Every verb form for which both are given correctly counts as two points. The total number designated correctly constitutes the score. The following are provisional standard scores.

			High School				College
Grade.....	7	8	F.	S.	J.	S.	S.
Score.....	13	16	20	23	26	30	45

Limitations and Improvements of the Tests. The two chief limitations of these tests are, first, the failure to cover all phases of grammatical knowledge and, second, the counting of any designation of a part of speech, case, tense, or mode as equal to any other. The former shortcoming may be overcome by adding other tests of a similar nature to cover the remaining aspects of grammatical knowledge. A test on sentence analysis or diagramming ought very likely be added. The second limitation may be remedied by scaling the values of the various designations. In spite of these limitations, which fundamentally are not of a serious character, these tests provide measures of grammatical knowledge which are quite accurate and far more accurate than ordinary methods of testing and marking. These limitations are pointed out here because it is important to recognize in a fair way what the defects of any scale or test are, since the ultimate usefulness of any measuring instrument depends upon its degree of accuracy.

COMMUNICATIONS AND DISCUSSIONS

DISPARITY OF SPELLING SCALES

The two spelling scales recently published, one by Buckingham and one by Ayres, show eighty-five words in common, enough to make a comparison of the two scales fairly reliable. The fact that these eighty-five words constitute a larger percentage of Buckingham's list than of Ayres' would seem to make little difference, since in each list the words are scaled individually and bear an individual rather than a group relation to the other words and to the respective scales. It will be recalled that Ayres arranges his list in groups, A to Z, ranked in order of increasing difficulty from the easiest to the hardest, as determined by the percentage of pupils in the various grades who spell the words correctly, and that the words in any particular group are of "approximately equal spelling difficulty." Buckingham, on the other hand, scales each word separately, giving it a numerical value in terms of probable error which is computed from a calculated absolute zero of difficulty. For details of these values the reader is referred to the original monograph, and to the writer's discussion in a current number of *School and Society*.

The list of words in Table I is shown in the order of difficulty as indicated by Buckingham, with the scale values set opposite each word. In the next column is the letter indicating the group in which Ayres places the word. A rough examination of the two scale notations shows a decided lack of agreement. To determine the exact relationship for each of the words it is necessary to reduce them to some common measure. The standard deviation is probably the best measure in such cases. Hence, by assigning arbitrary values with unit intervals to Ayres' group the standard deviation was found to be 6. Similar calculation based upon Buckingham values shows the standard deviation in this case to be 164. These two values are directly comparable showing that one unit of Ayres' scale is equivalent to 27.33 units of Buckingham's scale. With this as a basis, and by calculating from the median point of the two distributions, Ayres' positions may be read in Buckingham's units.

TABLE I

Words	Buckingham Scale values	Ayres' groups	Buckingham's groups	Differences	Preferred words	Words	Buckingham Scale values	Ayres' groups	Buckingham's groups	Differences	Preferred words
he	245	E	A	115		bought	587	M	M	-8	-8
is	265	C	B	40		also	591	M	M	-12	
the	277	D	B	56		pretty	601	M	N	-22	-22
and	298	B	C	-20		getting	615	O	N	18	
will	300	E	C	60		Tuesday	625	O	O	8	8
on	301	B	C	-23		sure	627	N	O	-21	-21
go	328	B	D	-50		answer	629	P	O	32	32
me	336	A	D	-95		nor	635	N	O	-29	-29
to	343	H	D	99		raise	635	O	O	-2	-2
for	348	H	E	92		beautiful	638	P	O	23	23
you	371	E	E	11		almost	640	M	O	-61	
not	374	E	F	-14		ought	644	T	O	-136	
man	377	D	F	-44		forty	646	O	O	-13	-13
do	378	A	F	-127		always	652	N	P	-46	
in	381	D	F	-48		weather	652	O	P	-19	
him	385	F	F	2		wear	654	R	P	61	61
no	388	D	F	-55		chain	664	N	P	-58	
one	388	H	F	54		minute	664	T	P	116	116
at	405	B	G	-127		whole	672	O	P	-39	-39
into	408	F	G	-21		running	672	Q	P	16	
are	411	G	G	4		often	677	S	Q	66	
of	413	F	G	-26		against	681	R	Q	34	34
has	416	H	G	26		neighbor	691	R	Q	24	
all	418	F	G	-31		guess	706	T	R	64	64
school	427	G	G	-12		purpose	728	R	R	-13	
they	483	K	J	41		present	735	Q	S	-47	
light	493	K	J	31		already	740	R	S	-25	-25
every	506	J	J	9		believe	749	S	S	-6	
coming	509	K	J	15		receive	759	N	T	-153	
send	516	H	K	-76		beginning	762	U	T	35	35
only	527	K	K	-3	-3	improvement	778	S	T	-35	
even	540	K	L	-16	-16	assure	781	U	T	16	
road	543	L	L	8		sometimes	798	Q	U	110	
because	543	L	L	8		importance	800	P	U	-139	
table	544	L	L	7		accident	802	P	U	-32	
picture	557	M	L	22		too	819	S	V	-76	-76
learn	557	N	L	49		therefore	830	S	V	-87	
front	576	N	M	30	30	experience	836	V	V	-11	
another	578	L	M	-27	-27	business	847	T	W	-77	
pass	579	L	M	-28		character	848	W	W	4	
pair	582	N	M	24		necessary	862	W	W	-65	
lesson	584	L	M	-33	-33	disappoint	868	X	X	11	
thought	586	N	M	20							

Av. Dis. 42
Av. Dis. 33

The method of determining these values was as follows: The average of Ayres' values was found to lie midway between groups L and M. The average for Buckingham's values was found to be 565. By superimposing these two points, and subtracting and adding one-half the interval value to Buckingham's average, the readings for L and M respectively are obtained. By subtracting the interval value –27.33 successively from L, K, etc., values may be found for each of the groups to the lower end of the scale. By adding this interval value successively to M, N, etc., values may be found for each of the groups in the upper reaches of the scale. These values are shown in Table II.

TABLE II.

Showing spelling difficulties of the median of Ayres' groups in terms of Buckingham's scale units

A = 251	J = 497	S = 743
B = 278	K = 524	T = 770
C = 305	L = 551	U = 797
D = 333	M = 579	V = 825
E = 360	N = 606	W = 852
F = 387	O = 633	X = 879
G = 415	P = 661	Y = 906
H = 442	Q = 688	Z = 934
I = 469	R = 715	

Now, assuming that the values thus assigned are the median values for Ayres' groups, the span for any group would include all values lying within 13.67 units on either side of the median. In this way the words have been placed in Ayres' groups according to Buckingham's values. The positions thus taken are shown in the fourth column of table I. It is seen here that only nineteen words remain in the group where Ayres placed them. The approximate amount of displacement may be found by subtracting in each case Buckingham's value from the median value of the group in which Ayres originally placed the word. These differences are shown in the adjacent column in table I. The average displacement is found to be 42 of Buckingham's scale units, or 1.52 of Ayres' units. The probable displacement counting median to median is about 1.3. When the calculation is is based only on those sixty-six words which lie outside the groups where Ayres placed them, the average displacement amounts to 55.77 of Buckingham's units, or 1.89 of Ayres'. It is probable that Buckingham's "preferred" words are more reliably placed than the upper and lower supplementary lists. When only the 22 words of Buckingham's "preferred" list are considered, the displacement is 33 of Buck-

ingham's units or 1.3 of Ayres' units with a probable displacement of about 1 of Ayres' units, showing that the claims to greater reliability are justified. The extreme displacements, *e. g.*, "minute" from T to P, and "receive" from N to T, show a total range of 10 of Ayres' units. One of these extremes, furthermore, is in Buckingham's "preferred" list. Assuming that Ayres' placement is correct, it is seen that Buckingham's values are approximately correct for nineteen of the words, are too high for thirty-eight and too low for thirty-eight of them. Buckingham's "preferred" values are in conformity in five cases, are too high in eight and too low in nine cases.

The general conclusion is that the two scales are in such disagreement as to the relative difficulty of the words that are common to them that both may well be challenged until the trustworthiness of one of them has been established. Such a procedure should not be difficult since these larger fundamental studies have blazed a trail for future students. Let us hope that by concentrating upon a few words at a time, wholly trustworthy points upon the scale may be established so as to give a basis for a closer study of just why words really require greater spelling ability.

L. W. SACKETT.

University of Texas.

TEACHING DENOMINATE NUMBERS

A topic rarely mentioned in experiments on Arithmetic is that of the teaching of denominate numbers. This topic usually appears about the sixth year of the child's school life, receives very little attention from the makers of text books, and up to the present time has been hardly noticed in the ever increasing volume of arithmetical investigations. The following is an account of an experiment which might be helpful to teachers and supervisors of arithmetic.

The purpose of the experiment was to determine the best method of making permanent the necessary associations that have to be formed in memorizing the various items in the tables. The usual method of teaching these tables is to have the children memorize item after item, and after various parts of the tables have been thoroughly memorized, they are generally applied to problems. In the experiment performed on one hundred school children, the following method of procedure was adopted: First, an intelligence test was given. This consisted of seven arithmetical problems and part of the language

tests selected from Bonser's Tests. These tests were given to four classes of the 6A (sixth year, first half). Upon the results derived from these tests, two classes were selected which were of equal intelligence. These two classes were given the following experiments. The procedure adopted was as follows: The table that was to be memorized was cubic measure, consisting of the following items:

1728 cu. in. equals 1 cu. ft.
27 cu. ft. equals 1 cu. yd.

It was first ascertained that this table was entirely unfamiliar to the pupils of either of the two classes selected. The method of presentation in one class followed the traditional custom. The two items were presented. Each of the children was called upon to repeat each part. The class repeated in unison. Blackboard and written drill followed. This was continued for a period covering ten minutes each day for a period of three days.

The second class was given problems the solution of which called for a knowledge of the tables. Each child received a mimeographed sheet containing the two items of the table that were to be memorized. About five or six problems were presented each day. The time covered in this class was the same as in the traditional drill class; namely, ten minutes each day for a period of three days. On the fourth day a similar test was presented to each of the classes. During the test the applied drill class were not permitted to use the mimeographed sheet containing the tables.

The results obtained from the test were as follows:

6A—traditional drill class averaged 58%
6A—applied drill class averaged 64%

For our purposes it was not considered necessary to make a further analysis of the results, except to obtain an average.

During the following week, the attempt was made to give each of the two selected classes the portions of the linear table which had not yet been taught in the previous grades. The elements that were made the subject of instruction were:

5½ yds. equals 1 rd.
320 rds. equals 1 mile

In the course of this experiment, the class which had been given the traditional method of drill was now tried by the new method of applied drill; while the class that had been given the applied drill was now

given the traditional method; time allowance was the same; namely, periods of ten minutes extending over three days. The results were as follows:

Traditional Drill class averaged—62%
Applied Drill class averaged—68%

Upon examination of the course of study of any city in the United States we find that in the fifth and sixth years of the school life of the child about one-half to three-fourths of the time spent on arithmetic is devoted to learning the various tables and their use in applied problems. It is therefore important that an economical method of teaching such tables be found. It may be that the method of applied drill takes as much time as the traditional methods, but if the results are better, the method used justifies itself.

It appears from the results obtained in our experiment that the applied drill class has in every case given the better results. The extra task of preparing the mimeographed sheets would be repaid by the greater efficiency obtained in the use of the tables.

ISIDORE SPRINGER.

Principal, P. S. 25, New York City.

AN EDUCATIONAL LABORATORY

The University Elementary School, at the University of Missouri, served in a striking way in the summer session of 1915 to show the value of such an objective instrument in the study of problems of supervision and elementary education. Theory was quite set aside and the daily work of this school was the object of study. Professor Meriam conducted one course in supervision and one course in elementary education. Thirty-eight superintendents in the former and one hundred thirty-eight grade teachers in the latter were required to spend a minimum of two hours each week observing in this elementary school. Interest in the work of this school led to an average of one hundred and twenty-five observing teachers daily.

This University Elementary School is a laboratory in the School of Education. The curriculum is the chief professional problem now studied. A curriculum is being formulated in terms of the activities of children and of adults in home and community life. The problem for the school is, "To help boys and girls do better in all those wholesome activities in which they normally engage." The subject matter in the traditional "Three R's" is taught only as it is needed.

The school last summer enrolled about one hundred pupils, distributed throughout the seven grades. None of these pupils received any mark of credit or advancement for the work. The school was in session five weeks, from 9 to 11 each day. From 11 to 12 each day pupils were invited to use the play ground apparatus (baseball, swings, giant stride, etc.) under direction of a playground teacher. At the end of the five weeks the regular school work closed, but the children were promised that the playground would be kept open for two weeks longer, However, the playground was not as attractive as the school and there were too few pupils to continue it.

The school was taught by the four regular teachers, and was conducted very much as in the regular session. Professor Meriam devoted two hours, 9 to 11, to directing the 125 observing teachers. At 11 and 12 he met his two classes for lecture and discussion. About one-half the time the larger class met in sections conducted by the instructor's assistants. For each hour of observation each visiting teacher was required to write on a 3 by 5 card a report of his observation. Special topics were announced from time to time. These reports served to center the attention of observers and were a basis for class discussion. Comparatively little educational literature was used but considerable attention was devoted to an excellent school library of about 2000 volumes. This library is used in the University Elementary School in place of text books.

Plans are being made for a still more extended use of this school in the summer session of 1916.

J. C. B.

THE

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EDITORIAL

The Teaching of Natural Science

It is trite to say that we live in a scientific age, but the statement needs to be reiterated and reflected upon, with particular reference to its significance for education. In spite of the ever increasing activity in scientific investigation in the past half century, in spite of the cogent arguments that have been offered from Herbert Spencer's time to the present day for a greater consideration of science and the development of the scientific point of view in education, in spite of the titanic struggle now in progress, which is showing so conclusively to the nations involved the importance of thorough training in the natural sciences, public education is still dominated by traditional aims, and little is being accomplished in inculcating the scientific temper of thought. The recent investigation of Mr. Harris Hancock in *School and Society* shows that the majority of our leading men are entirely under the domination of the mathematical-classical ideal, and are almost impervious to the need for general information as to the progress of science.

Of the four subjects that are of fundamental significance in any scheme of education, viz.: English, natural science, social science, and art, there would seem to be abundant reason from a study of the trend of contemporary life for putting natural science second only to English in its importance for education, yet the teaching of natural science presents a sorry spectacle of inadequacy or misdirected effort all along the line. In the elementary school there seems to be a reaction against the little time and attention that was formerly devoted to science teaching. Nature study has stood still or even declined in popularity, geography scarcely receives the relative amount of time that was formerly devoted to it, and physiology is taught largely in the interests of prohibition propaganda.

In the high school the enthusiasm for the study of science, which was so general a few decades ago that it threatened the existence of some of the other subjects, has died down, and the number of pupils taking science have relatively lost rather than gained ground. Science courses in college seem to be dominated largely by the aim of training for higher specialization, and the tendency is to eliminate more and more of the general student body. The teachers of science themselves are largely responsible for this. There has been too much insistence on consecration to scientific method, and the formal disciplinary idea of science as developing accuracy of method in thinking has come to be the lode star of science instruction. As a result the claim is made that elementary pupils are not sufficiently mature for the development of the scientific attitude of mind. The observational study of nature has been decried and flouted as unscientific, and little has been done to improve or develop the study of science in the elementary schools. In the high schools the teachers have been college trained, and have tended to carry over the methods by which they were taught to the pupils which now confront them. As a result, forms of physical experimentation and the mathematical aspects of physics have received undue attention at the hands of high school teachers. In college the cultural and general aspects of science are obscured by the technical and mathematical treatment, and those who do not intend to make professional use of the subject prefer to stand aside. The teaching of science needs a complete reorganization from bottom to top from the point of view of developing the keenest possible interest in the student for a broader knowledge of scientific discoveries in the world about him.

J. C. B.

NOTES AND NEWS

The president of Columbia University has nominated the following professors of the faculty of education to be members of a department of educational research, which department is charged with the work of instruction and research leading to the degree of doctor of philosophy for all candidates for that degree who elect education as their major subject: Professors Russell, McMurry, Monroe, E. L. Thorndike, Sachs, Dewey and Strayer.—*School and Society.*

In the training of teachers for elementary and secondary schools an apprenticeship in the actual work of teaching, under competent supervision and guidance, is receiving greater and greater emphasis. Dr. F. J. Kelly, director of the training school of the Emporia, Kansas, State Normal, and recently elected dean of the school of education at the University of Kansas, plans to secure a semester's work in practice teaching for every person who is preparing to teach in Kansas schools. Students who have already had experience in teaching will be assigned to model school classes, and those who have had no experience will be assigned to training teachers in the city schools. These training teachers will be appointed by the state, and will receive five dollars a month additional salary. In the neighboring state of Oklahoma sixteen high schools have complied with the provisions of an act passed by the last legislature, and have established courses for the training of elementary teachers.

Current educational journals announce the death of Booker T. Washington, founder and president of Tuskegee Institute, the best known educator that the negro race has produced; of Z. X. Snyder, president of the Colorado State Teachers College, for many years a prominent figure in the affairs of the National Education Association; and of John A. MacVannel, professor of the philosophy of education in Teachers College, Columbia University, author of important books on the history and principles of education.

John P. Garber, associate superintendent and author of several yearbooks on current developments in education, has been elected superintendent of schools of Philadelphia.

Dr. E. C. Elliott, professor of education in the University of Wisconsin, has been appointed Chancellor of the University of Montana. This office, which has but recently been created, carries with it the management of all the higher educational institutions of Montana. The appointment is a notable one.—*The American Schoolmaster.*

Dr. R. H. Richardson, for the past two years head of the department of psychology in the Kearney, Nebraska, State Normal School, has been appointed professor of education in the University of Maine.—*The American Schoolmaster.*

J. Mace Andress, who has been head of the department of educational psychology and school hygiene at the State Normal School, Worcester, Mass., for the past seven years, has been elected head of the department of psychology at the Boston Normal School to succeed Dr. Colin A. Scott, recently appointed professor of education at Mt. Holyoke College. Mr. Andress has the degrees A. B., Michigan State Normal College, '05, Ph. M., University of Chicago, '06, and A. M., Harvard University, '08. He was a scholar in education at Harvard, and for the last two years has been an honorary fellow in pedagogy at Clark University.

CURRENT PERIODICALS

SCHOOL AND SOCIETY. Vol. II, No. 27. July 3, 1915.
FELIX ARNOLD. *The Unit of Supervision, Cost and Efficiency.* 1-11. A study of a questionnaire sent to eighty-three principals of New York City schools on the six most important functions of the school principal, and the chief deterrents to the rendition of the best service by the principal, is made the basis for a unit scheme of administrative work, involving supervision, classification and promotion, clerical work, and attention to visitors. The scheme is worked out on the basis of unit cost, and the author claims for it increased efficiency of service with reduced expenditure of money.

No. 28. July 10, 1915. HAROLD SELLERS COLTON. *The Bearing of High School Science on a College Course in General Zoology.* 69-72. One sometimes hears the view expressed by college teachers of science that they would rather have students who have had no previous science training in the high school than those who have had work in science. The present article is a statistical study of students from public high schools and private schools in the vicinity of Philadelphia on the basis of their previous science training and their attainments freshman zoology, Latin, and mathematics in the University of Pennsylvania. Students from private schools make a poor showing in zoology, while those from the Philadelphia high schools in which there are good courses in botany and zoology make the best showing. Chemistry and physics are of no advantage to a student for his standing in college zoology. The distribution of mathematics grades is like that for zoology, but students in private schools do as well in Latin as those from Philadelphia high schools.

No. 29. July 17, 1915. WILLIAM E. KELLICOTT. *The Examination of Certain Objections to the Missouri System of Grading.* 81-88. A defense of the Missouri system of grading in terms of ranking within a group, and an examination of the principal objections that have been offered to it. While admitting that the system has imperfections, the author believes that it is far superior to any other system of grading yet proposed.

ERNEST C. MOORE. *An Experiment in Teaching College Students How to Study.* 100-107. Four tests were given to a group of Harvard freshmen. In the first test they were given a selection from a newspaper, were allowed to read for one minute, and were asked to record the number of words read and to reproduce what they had read. A second test involved re-reading the selection. In the third test they were given the same selection and allowed fifteen minutes in which to write down all the questions they could raise concerning its contents.

In the fourth test they were given a new selection and allowed fifteen minutes to write a summary of it. The results of these tests are presented in a series of six diagrams.

No. 30. July 24, 1915. J. E. WALLACE WALLIN. *The Problem of the Feeble-Minded in its Educational and Social Bearings.* 115-121. A discussion of the care of mentally defective children after they leave the protection of the school. The author pleads for psycho-educational clinics that shall be assisted by social-industrial advisers or field agents, whose duty should include vocational surveys with reference to occupations suitable for the feeble minded, the placement of children, explaining to employers the child's limitations, protection from moral and economic exploitation, advice to parents, and the collection of reliable data on the economic after-careers of the children who leave our special schools.

WALTER A. JESSUP. *Standards and Current Practices.* 137-143. Returns from 867 cities on the topics that should be taught in arithmetic are here studied from the point of view of (1) the elimination of topics; (2) increased emphasis on topics; (3) the recitation time distribution; (4) the percentage of drill; (5) grade of text book introduction; (6) grade emphasis on topics; and (7) the standards of achievement. The last point is based upon Mr. Courtis' standards in fundamentals for the different grades.

No. 31. July 31, 1915. LUCY C. COGAN, AGNES M. CONKLIN, AND H. L. HOLLINGWORTH. *An Experimental Study of Self-Analysis, Estimates of Associates, and the Results of Tests.* 171-179. Twenty-five students, all of whom were acquainted with each other, were asked to arrange the names of the group in an order of merit according to their degree of possession of each of the following traits: neatness, intelligence, humor, conceit, beauty, vulgarity, snobbishness, refinement, and sociability. As each judge's own name appeared on the list, the ranking gave an indication of each student's estimate of his own status in each of these traits, as well as the position of his fellow students. The tests used were the Trabue Completion Test and six tests from the Woodworth-Wells Association Tests. The correlation of the psychological tests with estimated intelligence was high; that of academic records with estimated intelligence was low.

No. 32. August 7, 1915. W. D. REEVE. *Exhibit of High School Mathematics, Its History and Educational Value.* 191-197. An account of an experiment in the teaching of mathematics, in which an extended exhibit of work done by pupils and of models and devices for presenting mathematics in concrete form constituted an essential feature of the presentation. The author makes many excellent suggestions for vitalizing this exhibit and changing it to keep the interest of the students at a high pitch.

WILLIAM E. STARK. *Measurement of Eighth Grade Compositions.* 208-216. Two sets of composition papers were secured from eighth grade pupils of Hackensack, New Jersey. The first set contained

one hundred thirty-three, the second contained one hundred thirty-six papers. The subject assigned was "A Day of My Life," the time fifteen minutes, the space one page. An attempt was made to use the Hillegas and Harvard-Newton scales, but it was abandoned on account of the extreme variation. On the basis of the judgment of three judges, a scheme of six ranks was worked out. Samples were chosen for each of these ranks and these samples were evaluated in Hillegas scale units. This scale was then used in judging both series of compositions.

No. 33. August 14, 1915. LIGHTNER WITMER. *The Exceptional Child and the Training of Teachers for Exceptional Children.* 217-229. The author gives a valuable account of the history of the teaching of defectives, discusses the present interest in the training of the peculiar child, and presents arguments in favor of special training for teachers of this class of children.

DANIEL STARCH. *Can the Variability of Marks be Reduced?* 242-243. The author recounts an experiment in marking twenty-four compositions on the usual precentage scale, with seventy as the passing mark. The papers were divided into two groups of twelve each, and papers one to twelve were graded by eleven teachers, while papers thirteen to twenty-four were graded by twelve other teachers. Each teacher was then instructed to change his marks into terms of a five-step scale, so that one of the twelve papers would be marked Poor, two or three Inferior, four or five Medium, two or three Superior, and one Excellent. The values of these ratings were then computed in percentages according to an arbitrary scale, and the variation was found to be reduced to almost one half.

LYNN HAROLD HARRIS. *A Study in the Relation of Latin to English Composition.* 251-252. The author argues for Latin as a practical language, and shows that students who have studied Latin for four years are superior in spelling, definitions, and grades in rhetoric to those who have studied it for three, two, one, or no years. On the basis of these somewhat questionable returns, the author pleads for a clearer recognition of the value of Latin by teachers of English composition.

No. 34. August 21, 1915. ERNEST C. MOORE. *The Child in Modern Society.* 253-259. The author considers the effect of the present war upon our ideas of what is due the children, and makes the following demands of society: first, that the child be well born; second, that he be secured favorable physical surroundings in his early years; third, that he have a favorable home environment, which should be secured by the establishment of schools for mothers, on which attendance should be compulsory; and fourth, that a system of education be provided which will direct the attention of children to cultural rather than materialistic aims.

JOHN A. H. KEITH. *The Improvement of the Course of Study Through Organization.* 259-265. The objects of the course of study should

be first, to amplify experience; second, to extend the mental horizon of the child; and third, to influence immediate and future conduct. The author calls for an organization from the superintendent down to the room teacher that will provide consciously and definitely for these three things.

No. 35. August 28, 1915. HERBERT P. PATTERSON. *Shall Biological Failures be Our Teachers?* 297-301. The author points out that four out of every five of our teachers are women, and of these the majority who remain in the profession are "old maid school teachers," who are obliged by the dictum that prevails in boards of education to remain biological failures. The author pleads for a fair division of educational influence between men and women; but if for economic reasons, we must depend chiefly on the women, let us at least do away with the superstitious notion that through marriage a teacher unfits herself for the training of children.

B. W. KUNKEL. *The Distinction of College Graduates.* 316-324. A tabulation of the college graduates in the half decades from 1850 to 1900, whose names appear in recent issues of *Who's Who.* It is interesting to know that Amherst leads the list, followed by Dartmouth, Williams, and Wesleyan. It will be noted that universities, such as Harvard, Yale, Columbia, Chicago, Illinois, Wisconsin, etc., are not considered, but that the list is restricted to those institutions confining themselves to undergraduate work. If the figures are computed in terms of per cent. of alumni between 1850 and 1900, Williams leads all the rest, and has almost four times as high a percentage as her nearest competitor, Wesleyan.

No. 37. September 11, 1915. CHARLES N. MOORE. *On Correlation and Disciplinary Values.* 378-385. The author charges those investigators who have attempted to compute the co-efficient of correlation between attainments in different subjects with a highly arbitrary and highly unscientific procedure. He reviews a number of these correlation studies, and has himself computed the correlation of coefficients of 254 high school boys and 198 high school girls for successive grades in algebra and for marks in geometry and English. The correlations between algebra and algebra (boys 0.71, girls 0.65) are not greatly in excess of these between geometry and English (boys 0.52, girls 0.59). The author attempts to discredit the experimental work of the anti-disciplinarians, and to reinstate the belief in formal discipline.

CHANG PING WANG. *The General Effects of Visual Sense Training in Children.* 392-396. Extended experiments with school children led the author to conclude that sense training is a misnomer; that the principal means of transfer is found in the methods of work developed in training, and later on applied in the tests; that the amount of transfer depends upon the efficiency of the method used; and that the method developed in training may be better fitted for the tests.

No. 38. DAVID SPENCE HILL. *Survey of Industries and Mechanical Occupations in New Orleans by the Division of Educational Research.* 421-427, and 461-466. A condensed account of one of the most detailed and thorough vocational surveys that has yet been made. There is, first, a detailed analysis of the percentages of the pupils in each grade with reference to whether they are at age or over age. There follow the occupational history of 1472 boys and men in the night schools, an experimental study of delinquent boys, a study of American trade schools by personal inspection, personal visits to typical industries and occupations of the city, and conferences with both employers and trades unions. The final report, now in the hands of the city council, extends to over four hundred pages.

No. 40. October 2, 1915. FRANK STRONG. *Present Activities and Accomplishments of Higher Education.* 469-474. The author surveys the present status of American universities, pleads for a better balance between teaching and research, and foresees a revival of religious and spiritual ideals.

No. 41. October 9, 1915. EDWARD F. BROWN. *A Firmer Physical Foundation for Education.* 505-514. The author urges better school medical inspection, the devotion of the inspector's full time to the work, and adequate supply and proper training of school nurses, laws to compel parents to carry out the recommendations of the inspectors, and clinics for free treatment of those children whose parents are unable to assume the expense.

MABEL L. ROBINSON. *The Need of Supervision in College Teaching.* 514-519. The author has collected all of the arguments she could find against the supervision of college teaching, and proceeds to show how flimsy they are, and how advantageous such supervision would be for the students, the patrons, and the members of the faculty themselves.

J. B. SEARS. *Spelling Efficiency in the Oakland Schools.* 531-537. 569-574. The Ayres spelling test, as used in Springfield, Butte, and Salt Lake City, was given to 12,985 children of the Oakland schools, and the results here presented in a series of graphs, showing the distribution of results for different grades, and for differences of nationality and social status. The city ranks high as a whole, but the evidence shows that the children are poorly classified as to spelling, and that there are great differences in standards of achievement. Individual and social differences are clearly reflected in the results.

No. 43. October 23, 1915. MAX F. MEYER. *The Administration of College Grades.* 577-589. The author reviews the system of grading that has prevailed in the University of Missouri for the last seven years, and proposes a number of improvements to the scheme. One of these is that the necessary information be furnished by the instructor, but that the students' actual grades be computed, not by the teacher, but by a clerk. Detailed illustrations are given showing how the proposed scheme would function.

DANIEL STARCH. *The Inheritance of Abilities in School Studies.* 608-610. Studies of the records of children from the same family in spelling, reading, writing, and arithmetic give little evidence to support the conclusion that special abilities in certain studies run in families. Ability in school work is apparently inherited to the same extent as physical features, since the coefficients of correlations for children of the same parents are approximately the same for both physical and mental traits.

No. 44. October 30, 1915. FREDERICK S. BREED AND VERNON CULP. *An Application and Critique of the Ayres Handwriting Scale.* 639-647. The tests were given to twenty-five pupils from each of grades V, VI, VII, and VIII, random selection, in fifteen Michigan schools. The authors conclude that, while the Ayres scale was contructed on the basis of legibility, it cannot be regarded as a satisfactory scale for the measurement of the legibility of handwriting. The high correlation between Ayres scale values and Freeman form values tends to confirm the view that the Ayres scale measures form rather than legibility.

No. 46. November 13, 1915. FREDERICK G. BONSER, L. H. BURCH AND MARGARET R. TURNER. *Vocabulary Tests as Measures of School Efficiency.* 713-719. Kirkpatrick's vocabulary test was applied to 2,000 children of the Speyer school in New York City in grades four to eight, and a similar list from another dictionary was given to a small group of children in the same school. The records of the Speyer children were fifty per cent. higher than the Kirkpatrick figures for the corresponding grades, and by the second list the ratings were almost three times as high. Other tests were given in different schools, and the result showed a remarkable variation in vocabulary. The authors attribute the high rating of the Speyer school to the fact that the curriculum and methods of work link themselves organically to the range of ideas and words that are in vogue outside the school.

No. 47. November 20, 1915. ALBERT SHIELS. *The Rating of Teachers in the New York City Public Schools.* 752-754. In order to get some definite information regarding the reliability of ratings of teachers in New York City, ten descriptions of hypothetical cases of teachers were sent to one hundred and thirty-three principals, with a request for a rating in each case. One hundred ten returns were received. Tables of the distribution of ratings are presented, and the results show the necessity of some more detailed analysis of the teacher's function than prevails under the present system.

PUBLICATIONS RECEIVED

FRANK P. BACHMAN. *Problems in Elementary School Administration.* Yonkers-on-Hudson: World Book Company, 1915. Pp. x, 274. $1.50.

The present volume of the School Efficiency Series deals particularly with the problems of the classification and promotion of school children. There is a discussion of the rate of promotion, the size of class and its relation to promotion, absence, over-age, and inability to use the English language in their bearing on promotion, the significance of over-age, and the construction of age-grade reports. The author concludes that part-time and large classes are responsible for the non-promotion of relatively few pupils, that irregular attendance, late entrance to school, and sluggish mentality are the most important factors in preventing promotion.

E. W. BAGSTER-COLLINS. *First Book in German.* New York: The Macmillan Company, 1914. Pp. ix, 342. $1.10.

This is not a radical text, but attempts to steer a middle course between the advocates of conversational method on the one hand and the strict grammarians on the other. The author believes in an abundance of examples to illustrate grammatical usages and thus supplies much opportunity for conversation. The book is more richly illustrated than most elementary texts.

J. LYNN BARNARD, F. W. CARRIER, ARTHUR WILLIAM DUNN, AND CLARENCE D. KINGSLEY. *The Teaching of Community Civics.* Bulletin No. 650. Washington; Bureau of Education, 1915. Pp. 55.

This bulletin was prepared by a special committee of the commission of the National Education Association on the reorganization of secondary education. The bulletin sets forth the aims and methods of community civics and indicates a suggestive treatment of the elements of civic welfare, such as health, recreation, education, civic beauty, wealth, communication, transportation, charities and corrections. There are helpful lists of texts, source materials, and other aids in teaching.

MAURICE A. BIGELOW. *General Science, Nature-Study, and Biology.* Reprinted from the Nature-Study Review, May, 1915, Pp. 7.

The author proclaims his faith in an introductory course in science that is organized as education rather than as science, and that prepares the way for, but does not displace, the regular sciences of our schools.

W. F. Book. *First Annual Report of Vocational Education in Indiana.* Indiana State Board of Education: 1915. Pp. 169-230.

The report includes an account of the work of the state aided vocational departments of schools, of the instruction in elementary agriculture, domestic science, and industrial arts, of the trade extension work, of the county agents of agriculture, of the boys and girls clubs and of the home and school garden movement. The report urges a careful investigation of the occupations and industries of the state, and greater emphasis upon vocational and educational guidance in the upper elementary grades and in the high school.

Isaiah Bowman. *South America—A Geography Reader.* Chicago: Rand-McNally and Company, 1915. Pp. x, 354. $.75.

This is the second of a series of readers based on selected type-regions, and designed by the editors to bring out with the glow of story and the truth of science the human interest of geography. Each book is written by a specialist on the subject and as Kipling would say "By a man who can handle a pen." The author has spent ten years in the exploration and study of South America and therefore writes as one having authority. The book is richly illustrated and constitutes a valuable addition to the resources of the teacher.

Henry Seidel Canby. *College Sons and College Fathers.* New York: Harper and Brothers, 1915. Pp. 233. $1.20.

This is a series of essays on college life and the significance of college education by the assistant professor of English at Yale University. Among the topics chosen for the themes of the author's discourse are the undergraduate, his setting, the professor, college life and college education, culture and prejudice, the colleges and mediocrity, current literature, writing English, and teaching English. The author's style is racy and piquant and his reflections upon college life are interesting, although not entirely complimentary to the undergraduate. The author indulges in an interesting speculation as to the amount of energy expended by a professor in an average recitation. If we assume that "thirty foot-pounds go into the arduous but stimulating process of preparation, and thirty are consumed in the pleasant and invigorating operation of really teaching an aroused and interested class, then a good forty are exhausted, burned up, wasted, in merely overcoming resistance to know—in fighting indifference, and sometimes sullen dislike."

William A. Cooke. *Schoolhouse Sanitation. A Study of the Laws and Regulations Governing the Hygiene and Sanitation of Schoolhouses.* Bulletin No. 648. Washington: Bureau of Education, 1915. Pp. 69.

This is an interesting digest of the enactments of the several states with reference to the school site, the water supply, toilets, protection

against fire and panic, lighting, heating, ventilation, cleaning, and furniture and equipment. Perhaps the most significant recent movement is the revolt against the common drinking cup and the common towel.

ELLWOOD P. CUBBERLEY. *The Portland Survey. A Textbook on City School Administration Based on a Concrete Study.* Yonkers-on Hudson: World Book Company, 1915. Pp. xiv, 441. $1.50.

Section one deals with organization and administration, with an excellent criticism of that type of school board which regards as its duty the administration of the schools to the smallest detail. Section two deals with instructional needs, criticizes the curriculum as conventionalized, and outlines an educational program adapted to local educational needs. Section three considers buildings and the supervision of health, and Section four deals with attendance, records, and costs. Arithmetic and grammar are the best taught, while reading and composition make a poor showing.

GEORGE VAN NESS DEARBORN. *Economy in Study: Certain Practical Points, Psychological and Physiological on How to Study to the Best Advantage.* Reprinted from the Medical Record, June 5, 1915. Pp. 15.

The author emphasizes as the most important points in successful study an interest in the study, the development of the ability to inhibit all extraneous ideas and distracting stimuli, the multiplication of associations so that the data studied have a logical setting and are not mastered by merely rote learning, fit physical condition, breaking the strain of concentration by brief physical exercise every twenty minutes, and the development of visualizing imagination.

J. C. DEVOSS AND ROSE GANSON. *Color Blindness of Cats.* Reprinted from the Journal of Animal Behavior, Vol. 5, No. 2, March-April, 1915. 115-139.

The color stimuli used were colored papers inside jelly glasses and the test was whether cats could learn to distinguish and react to the proper food glass for thirty successive choices. The authors conclude that cats cannot distinguish any one color from all the shades of gray under light adaptation. It is possible that the animal may be totally color-blind by daylight.

MARCUS DIMSDALE. *A History of Latin Literature.* New York: D. Appleton and Company, 1915. Pp. ix, 549. $2.00.

This book is intended for the general reader, rather than for the classical expert, and the author has therefore endeavored to represent

the personality of the great Latin writers and to interpret their significance in the development of literature in such a manner as to be appreciated by the ordinary student. One of the most important arguments for the study of the classics is the desirability of becoming familiar with their literature. The opponents of required classical study usually grant this desirability but claim that much greater familiarity could be secured in much shorter time by reading classical authors in translation. For those who advocate such a study of the classics the present history of Latin literature would prove a valuable adjunct to its study.

H. J. FOGHT. *The Rural School System of Minnesota. A Study in School Efficiency.* Bulletin No. 647. Washington: Bureau of Education, 1915. Pp. 156.

The monograph presents a general account of the rural school organization of the state, explains the administration of schools in large undivided school districts, describes the so-called associative schools, gives an account of the consolidation of rural schools, discusses industrial education in rural communities, and gives some attention to the training of teachers for these schools.

H. J. FOGHT. *The School System of Ontario, with Especial Reference to the Rural Schools.* Bulletin No. 659, Washington: Bureau of Education, 1915. Pp. 58.

The bulletin gives a brief sketch of rural conditions in Ontario, the provincial organization of education, recent progress in industrial education, and the preparation and salaries of teachers.

NORMAN FROST. *A Statistical Study of the Public Schools of the Southern Appalachian Mountains.* Bulletin No. 636. Washington: Bureau of Education, 1915. Pp. 71.

A study of the illiteracy of the inhabitants of the mountainous portions of the southern states and the means that are being taken to remedy this condition. The author reports that conditions vary from the very worst to very nearly the best, but are everywhere constantly improving. Teachers' salaries are low and the teachers have little or no professional training. The expenditure for education is very much less than it should be, but public sentiment in favor of good schools is developing.

CHRISTIAN GAUSS. *Through College on Nothing a Year.* New York: Charles Scribner's Sons, 1915. Pp. xv, 174. $1.00.

A graphic account of the experiences of a boy who was brought up in the slums, and earned his way through Princeton University.

The story is one of enthralling interest, and throws a brilliant light on the opportunities which are open to an energetic young man in almost any of the larger colleges of this country.

HENRY HERBERT GODDARD. *The Criminal Imbecile. An Analysis of Three Remarkable Murder Cases.* New York: The Macmillan Company 1915. Pp. ix, 157. $1.50.

The recognition of feeble-mindedness as one of the most potent causes of crime leads to new ideas about the prevention of crime and the treatment of criminals. It is to further the spread of such ideas that the present book is written. The cases described here are unique "in that they were the first court cases in which the Binet-Simon tests were admitted in evidence, the mental status of these persons under indictment being largely determined by this method." In addition to the description of the cases there are chapters on the criminal imbecile, on the responsibility of the feeble-minded, and on the punishment for criminal imbeciles. In the latter chapter, the author insists that the old fashioned idea of revenge, which is the underlying motive in punishment, must be given up for the more rational one of protection —protection of society, protection of the weak individual himself. Careful examination of each one of these young murderers would have revealed the fact that they were mental defectives, and, if they had been treated as such, there would have been no opportunity for the crimes they committed. The real criminal act is that committed by society in allowing such individuals to roam at large, the prey of the sinister influences of their environment.

C. JUDSON HERRICK. *An Introduction to Neurology.* Philadelphia: W. B. Saunders Company, 1915. Pp. 355. $1.75.

Studies in modern psychology and education lay more and more stress upon the structure and functioning of the nervous system. While it is true that the introspectionists claim that the phenomena of consciousness can better be studied without any reference to the nervous system, for an ultimate causal explanation of mental phenomena they are driven to posit nerve impulses and patterns of neural activity. Even in psychology there is a reaction against the introspective analysis of consciousness, as may be seen in the writings of the functionalists and the behaviorists. In education there is a growing tendency to consider the biological organism as a whole and to focus attention upon the adjustments which this organism makes to its environment. For both classes of students therefore the present book will be of value. Written from the point of view of the biologist rather than from that of the medical man, and having as its author one of the most prolific contributors to the subject of comparative neurology in this country, the book is scientific in its construction and authoritative in its pronouncements. There are magnificent

illustrations on almost every page, and each chapter ends with an excellently chosen bibliography of the topic treated. The author points out in his preface that the chief problems of neurology at present are of two sorts: "First, to discover the regional localization within the nervous system of the nerve cells and fibers which serve particular types of functioning, and, second, to discover the chemical or other changes which take place during the nervous functioning, that is, the metabolism of the nervous tissues. The first of these problems is at present further advanced than the second. The larger part of this work is therefore devoted to a description of architectural relations. Without a knowledge of these relations, however, the problems of metabolism are in large measure meaningless."

JOSEPH JASTROW. *Character and Temperament.* New York: D. Appleton and Company, 1915. Pp. xviii, 596. $2.50.

This is a volume in the Conduct of Mind Series, the purpose of which is "to provide readily intelligible surveys of selected aspects of the study of mind and of its applications." The scope of the work may be seen by the chapter headings which are the scientific approach, the sensibilities, the emotions and conduct, the higher stages of psychic control, temperament and individual differences, abnormal conditions of minds, the psychology of group traits, character and the environment, and the qualities of men. The author states that the subject of the volume is the psychological sources of human quality, and he remarks that "the course followed in this survey is substantially without precedent; although there is considerable community of content with volumes bearing a similar title, and with others that consider the analysis, the emotional basis, and the social expression of human nature." It is a solid, well-wrought volume, which makes no little demand upon the thoughtful attention of the reader.

I. L. KANDEL. *The Training of Elementary School-teachers in Mathematics in the Countries Represented in the International Commission on the Teaching of Mathematics.* Bulletin No. 666. Washington: Bureau of Education, 1915. Pp. 56.

The subject is developed by countries in alphabetical order. In each case an attempt is made to sketch in some detail the work of training schools in arithmetic, algebra, and geometry. Most interesting are the methods of training teachers in elementary mathematics in England and Germany. "No country," the author states, "is making greater progress in the training of its teachers than Germany, and in no subject is this more true than in mathematics." A comparison of the work in different countries is illuminating and instructive.

ALBERT GALLOWAY KELLER. *Societal Evolution. A Study of the Evolutionary Basis of the Science of Society.* New York: The Macmillan Company, 1915. Pp. xi, 338. $1.50.

The author regards the conception of folk-ways, as developed by Professor Sumner, the link connecting organic and societal evolution. The subjects treated are the evolution of the human type, variation, selection, both automatic and rational, counter-selection, transmission, and adaptation. The book is stimulating and broadening, and furnishes an excellent background for the teacher's life philosophy.

PAUL KLAPPER. *The Teaching of English. Teaching the Art and the Science of Language.* New York: D. Appleton and Company, 1915. Pp. xii, 263. $1.25.

The author divides his book into two parts: the expressional aspect and the formal aspect of composition. The author agrees neither with the extreme conservatives nor with the ultra-radicals, and tries to steer a middle course, advising much written work in composition with a certain amount of correction and rewriting, if the rewriting is the result of a genuine effort on the student's part to improve the expression of ideas. The rewriting of compositions as penmanship exercises or mere exercises in neatness is condemned. The attacks against formal grammar are recognized and liberal reduction in grammar requirements is urged.

SAMUEL C. KOHS. *New Light on Eugenics.* Reprinted from the Journal of Heredity, Volume 6, No. 10. Oct., 1915. Pp. 446-452.

A criticism of some of the sweeping claims made by recent writers on heredity with regard to the inheritance of mental traits. The author believes than an individual's future mental attainments are by no means so far removed from motivation by the individual's personal efforts as many writers seem to imply. There is a bibliography of forty numbers.

ALBERT LEAKE. *Means and Methods of Agricultural Education.* Boston: Houghton Mifflin Company, 1915. Pp. xiii, 273. $2.00.

The volume discusses the present methods of agricultural education, outlines plans for improvement, and suggests new methods whereby rural schools may be given an education based on their environment and adapted to the needs of rural districts. The treatment is largely historical and reviews the development of agricultural education, the conditions of social life, the rural school, the consolidation of schools, rural school extension, types of secondary education in agriculture, the history of agricultural colleges, farmers' institutes, the status of farm women, and the training of teachers for rural schools. Special attention is called to the exodus of girls from the rural districts, and a strong plea is made for better home conditions on the farm.

E. G. Lutz. *Practical Drawing. A Book for the Student and the General Reader.* New York: Charles Scribner's Sons, 1915. Pp. 250. $1.25.

The author believes that drawing from actual objects should not be as difficult as it is usually thought by beginners. To supply a method of attack that will bring results quickly and with satisfaction is the purpose of the book. In general the author proceeds somewhat as the sculptor, blocking out his surface in large outlines and gradually filling in and elaborating details. There are chapters on charcoal and crayon drawing, water color painting, pen and ink drawing, perspective, pictorial composition, lettering, drapery, and drawing materials. The book is radical in its claims and attractive in the promise of speedy attainment which it holds out to the neophyte, but there is room for some skepticism as to whether results will follow with such speed as the writer implies.

Clinton P. McCord. *One Hundred Female Offenders. A Study of the Mentality of Prostitutes and Wayward Girls.* Reprinted from the Journal of Criminal Law and Criminology, Sept., 1915.

The 38 girls tested ranged from 12 to 40 years of age, with an average age of 18. The average mental age was 9 years, while three tested 7 years, and one only 5 years. Only six were rated as normal in intelligence. The study strengthens the impression that much of our social irregularity can be traced to lack of intelligence.

Theodore L. MacDowell. *State Versus Local Control of Elementary Education.* Bulletin No. 649. Washington: Bureau of Education, 1915. Pp. 83.

The monograph gives an extended account of state aid, the right of localities to borrow money and issue bonds, state regulation of the taxing duties and powers of localities, and state intervention in the school finances of localities. In general, elementary school finances indicate divided control, with a fairly strong tendency towards centralization.

James Mahoney. *Some Foreign Educational Surveys.* Bulletin No. 664. Washington: Bureau of Education, 1915. 49 pp.

A brief account of school surveys made in Switzerland, England, Belgium, Ireland, Scotland, Germany, Austria, France, New South Wales, Sweden, New Zealand, and Canada. In the light of the recent survey activity in this country, it is interesting to note that a survey of gymnasia was undertaken in Austria as early as 1870, while some of the surveys in Scotland and Belgium go back so far as 1850 or even 1842. Indeed, it is probable that most European countries have

long been more critical of their educational facilities than have we in this country, and it is only recently that we have begun to apply the same criteria of efficiency to education that we have long used in industrial and commercial affairs.

ARTURO MONTORI. *Tipos de Apercepcion en un Grupo de Ninas Cubanas.* Havana, 1915. Pp. 164.

In his preliminary remarks the author gives a brief sketch of the development of the study of perception from Charcot and Galton to Stern and Meumann. There are chapters dealing with the philosophical doctrine of perception, and with modern psychological studies of the subject. The experimental portion of the monograph presents the responses of 94 children, from 7 to 16 years of age, to a marine picture with two human figures in the foreground. There is a detailed description of the accounts given by the children and the results are tabulated according to the type of imagination manifested and the character of esthetic emotion elicited.

Part-Time Education in Indianapolis. Prepared by the Committee on Education and approved by the Board of Directors of the Indianapolis Chamber of Commerce. Indianapolis, August, 1914.

Recommends an apprenticeship system to protect children from the "blind alley" jobs, and to train them for genuine productive activity in later life. The committee urges an adoption of a comprehensive plan for vocational education in Indianapolis.

CLARENCE ARTHUR PERRY. *The Extension of Public Education. A Study in the Wider Use of School-Buildings.* Bulletin No. 655. Washington: Bureau of Education, 1915. Pp. 67.

Among the uses to which school buildings are being put, as illustrated in this monograph, are meeting-places for music clubs, dramatic clubs, sewing circles, dancing clubs, social entertainments, basketry clubs, lectures, meetings of various societies, civic meetings, library stations, and elections. The author thinks that this work will undergo still greater and more systematic extension if we are to judge by the trend of present developments and the persistence of the forces behind them.

LOUIS W. RAPEER, Editor. *Educational Hygiene from the Pre-School Period to the University.* New York: Charles Scribner's Sons, 1915. Pp. xix, 650.

This elaborate handbook on health and its relation to the schools is the work of some 27 authors, each distinguished in some particular line of school hygiene activity. Part one, dealing with health sociology

treats of such topics as the public health movement, health and heredity, the home hygiene of children, and the social center as a means for the spread of health propaganda. Part two deals with the administrative aspects of the subject, such as the initiation of work in education hygiene in a school system, the general administration of school health, state co-operation for school health progress, and the serious problem of health in rural schools. Part three deals with medical inspection, including school nurses, public school clinics, open air schools, school feeding, and the exceptional child; with school sanitation both city and rural; with physical education, with especial attention to athletics and recreation; with the teaching of hygiene in elementary and high schools; and with the hygiene of instruction. In part four we have two chapters dealing with the hygiene of men's and women's colleges. There is a brief bibliography of school hygiene literature and an abundance of illustrations.

BURTON EGBERT STEVENSON. *The Home Book of Verse for Young Folks.* New York: Henry Holt and Company, 1915. Pp. xvii, 538. $2.00.

This is a most admirable collection of verse for children, ranging all the way from mother-goose melodies through charming nonsense jingles, fairy-land lyrics, Christmas poems, nature poems, classic ballads, and songs of patriotism, to the odes of Wordsworth, Shakespeare, Addison and Pope. The reader will find most of the old favorites and many new ones, such for example as the "Song of Sherwood," by Albert Noyes, and "The Fairies of Caldon-Law" by Mary Howitt.

WINIFRED SACKVILLE STONER, JR. *Facts in Jingles.* Indianapolis: The Bobbs-Merrill Company, 1915. Pp. 306. $1.00.

The public has heard so much about the poetical accomplishments of this young wonder-child that it is a satisfaction to have her productions collected in a single volume and made available for inspection. As Professor O'Shea points out in his introduction the jingles were written by a child for children. They were composed between the ages of five and twelve, and deal with an almost bewildering variety of subjects. A considerable number of them are written in Esperanto, in which language the child is quite an adept. Of particular interest are "A Bony Song," in which the catalogue of the 206 bones of the body is thrown into rhyme, "Thanksgiving in 20,000 A. D.," a clever satire on present tendencies in diet, "I'm Glad I'm not an Exo," an impromptu parody on a pupil's composition on "Bones," and a series of poems on the great musical composers. The volume is illustrated by numerous photographs of the author from the age of three months to thirteen years.

F. W. TAUSSIG. *Inventors and Money-Makers. Lectures on some Relations between Economics and Psychology, delivered at Brown University in Connection with the Celebration of the 150th Anniversary of the Foundation of the University.* New York: The Macmillan Company, 1915. Pp. ix, 138. $1.00.

This is a book on instincts, considered from the point of view of the economist. It is true that the modern behaviorist may take exception to the latitude of the use of the term *instinct*, when it is applied in such expressions as the "instinct of barter," "the instinct of contrivance" and "the instinct of devotion," but if we abstract from the peculiarities of terminology, we find much interesting material on the fundamental forces that make for invention and that underlie the amassing of fortunes. Finally the devotion of all one's energy to the pursuit of some goal whether this be the discovery of truth, the construction of a new machine, the finding of resources to supply human wants, or the building up of great organizations of capital, lies at the basis of all that is good and noble and substantial in civilization.

E. H. TAYLOR. *Mathematics in the Lower and Middle Commercial Schools of Various Countries Represented in the International Commission on the Teaching of Mathematics.* Bulletin No. 662. Washington: Bureau of Education, 1915. Pp. 96.

The bulletin presents a brief but fairly detailed account of the teaching of mathematics in industrial and commercial schools in the leading countries of the world.

The University and the Municipality. Summary of Proceedings of the First Session of the National Association of Municipal Universities. Bulletin No. 655. Washington: Bureau of Education, 1915. Pp. 66.

Part one, on the aims and purposes of the urban university, contains addresses by President Dabney of Cincinnati, President Kolbe of Akron, Commissioner Claxton, Dean Schneider of Cincinnati, Dean Burriss of Cincinnati, and President Cockayne of Toledo. Part two gives a brief description of typical urban universities. These include Akron, New York, Pittsburgh, Boston, Buffalo, Johns Hopkins, Toledo, Milliken University, Washington University (St. Louis), Cincinnati, Reed College (Portland), Louisville, Northwestern at Evanston, and the College of the City of New York.

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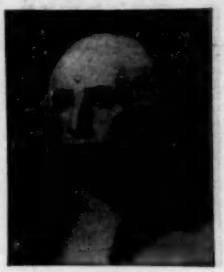

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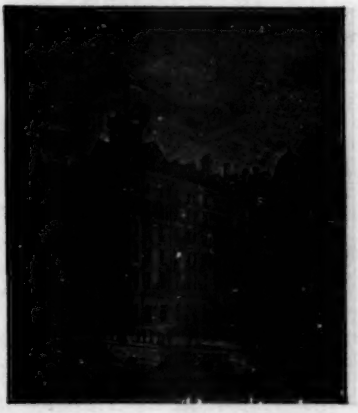

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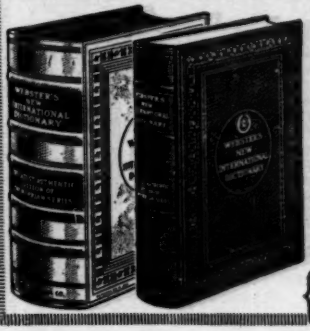

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